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St. Alban's.

Illustrators of Architecture. Some well-known Monographs.

HEN,—by the ordinary early course for an architect in Britain,—mind, eye, and hand had been fairly well trained, an eminent member of the profession urged Mr. Neale to thoroughly measure and draw St. Alban's, treating it as a *pièce de résistance*, and not allowing his other studies to prevent his doing it ample justice. This seed fell on good ground. Mr. Neale had the good sense to be ready, and the good fortune to be able, to intercalate such a period in his life, before commencing actively the work of directing others. The good old custom of so many masters of our craft was so well and so thoroughly followed, that capable judges recommended publication of the results. We gave, with pleasure, announcements and encouragements from time to time, with respect to the honours won in the course, and the progress towards completion, of the work; and, as soon as the long-promised volume was completed, we made use of it as a text,* commenting by the aid of illustrations and letterpress on problems at present receiving public attention in connexion with the building,—indicating, also, its true status as a monument of architecture, and as a record of parts of its history in England. We will now give a little attention to the volume itself, noting the manner in which a thorough and reliable book of reference has been produced, and slightly comparing it with specimens of the labours of other illustrators of architecture.

A short recital, of the manner in which the measurement of the great Church of St. Alban's was actually managed, should interest a fair number of people who warm towards any bit of actual experience,—all the while that they feel little disposed to accept with patience airy suggestions purveyed by others. The story is simple enough, and even a little suggestive of tedium, when it is all told. Perhaps every attempt,—to describe a well-purposed, well-executed scheme of the same sort,—would be liable to similar accusations. Comparison of experiences would, however, be of value, and might lead to an interesting compilation. As "observation maketh a full man, sketching a ready man, and measured drawings an exact man,"—a compiler "On Studies" might by chance do worse than teach precision by examples.

The church does not appear to have any extraordinary twists in the main lines,—such as are sometimes found in Mediæval buildings, as Whitby Abbey, St. Michael's Coventry, &c. A straight line can be imagined which should run inside the church, from east to west, and deviate by a few inches only from the centre line of any section of the length. The lines at right angles to such an axis,—for instance, the various east walls, the transepts, the main west wall,—seem also to have been set out with a fair attention to accuracy,—minor deviations, from what might have been looked for, occur, however, in every direction, some of them explicable more or less satisfactorily. The widths of the easternmost pair of Early English bays on the south side of the nave are near upon 2 ft. less than those of the nearly similar bays further westward, and than those of the north bays. Less pronounced differences,—the greatest being 9 in.,—occur in the Decorated bays. The north transept is 7 in. wider at the north than at the south; the slype was not properly squared with the south transept. The eccentricities in the present form of the Sanctuary have passed into a proverb; and been explained with much earnestness for thirty years, by conjecturing the original plan of that part of the Norman building. The walls of the lady-chapel incline slightly to the southward. Apparently to improve the effect from the ante-chapel, the east window of the lady-chapel is not in the centre between the north and south walls.

When such a list is being made, and seems likely to increase, as the distortion of the north wall of the nave aisle, and other comparatively modern changes come to mind, a good system of lines within and without the building appears to be indispensable, so that stations may be fixed as starting-points for detailed surveys, and the main dimensions properly obtained. A right line for laying down the axis could only be carried without a break through the doorways in the great screens. Such a line was carried from the east end to the west wall through the northernmost of those doorways. As the total internal length of the church is over 500 ft., a telescope was used in ranging from end to end. Large lumps of kneaded clay were placed at intervals upon the paving of the floors, in which wood laths were stuck. Positions and dimensions being fixed,—two other lines, exactly parallel to the original one, were run from end to end of the aisles,—just clearing the piers projecting from the faces of the north and south walls. The positions of the lines were marked, so that any part could be replaced when required. Strong whipcord could be strained for such distances as that from the rood-screen to the west door (205 ft.); and the base lines were thus replaced section by section. A square, about 16 ft. long in the arm, was used in setting up parallel lines,—running from north to south at right angles to the main base lines. These were obtained at the public passage through the ante-chapel, now happily likely to become a thing of the past; through the doorways leading from the aisles into the saint's chapel; immediately to the east of the great reredos; through the openings of the westernmost bays of the sanctuary next to the tower; through the transepts and tower; on the west side of the rood-screen; and at the west end of the church, (seven positions in all). A line was put down from east to west on the exterior, as a test of the correctness of the lines in the interior. Certain of the lines from north to south were run, through windows, &c., on to this external base line. The external line was used in obtaining the lines and dimensions of the great cloister and of the slype; also for the diagonals by which the external wall faces of aisles, transepts, &c., were tested on plan. For long dimensions, Chesterman's ribbon steel tape, 100 ft. long was used. Such dimensions, as a rule, were taken twice; the extreme dimension from east to west, which had piqued curiosity a good deal, was taken three times, with less than ⅛ in. of extreme variation. The tendency of a Mr. Mantalini towards diluted flippancy, at the sound of 550 ft. 1¼ in., might haply be restrained by such an explanation. The main lines and dimensions were laid down as soon as possible. Thereafter parts, such as the transepts, chapels, porches, &c., were plotted separately, and these smaller plans attached in their proper positions. Special lines for wall faces and piers were set up near to the walls, so that lengths and offsets could be taken by eye. When this could not be managed with safety, as in the piers of the nave, the large square was used, in order to mark dimensions upon the lines. Diagonal dimensions were taken pretty freely at every stage to assist in the detection of errors. The centre line of each pier was marked; and when it was determined to record on plate 4 all the differences in the various professedly similar bays, the parts between each pair of centre lines were dealt with in succession.

At about a dozen points in different parts of the building, a fixed level,—some 4 ft. above the level of the east end of the Sanctuary,—was marked by the aid of level and staff; and by a long mason's level this datum was carried wherever required. Special scaffolds were erected for measuring the detailed bays, illustrated on plates 12, 17, 33, and 38, and for the full details of those bays, which fill more than a dozen other plates. In the interior, the scaffold landings were fixed,—the first at the caps of the ground-story arcades, and the second and third at the triforium and clearstory levels. The centre lines of piers and bay being fixed, they were at once plumbed up and marked, and then all vertical dimensions could be taken on the

* See p. 445, *ante*.

nearest of these vertical lines. Many intermediate measurements were, of course, taken from ladders; but small scaffolds were necessary for capitals, arches, and mouldings. All the mouldings were taken full size by means of straight-edge and square; the cymagraph was discarded. For filling in profiles, in the general drawings and details, the mouldings were drawn to scale from the full sizes; for the plates, they were reduced by photography to a scale of one-third the full size. Plotting being carried on simultaneously with measuring, the jointing of the masonry was only measured, when a drawing otherwise completed was ready to receive it.

Many cold, windy days,—spent in the upper stages of the tower working on plates 26 and 27, varied by excursions on a plank let down by ropes from the parapet,—were necessary in order to warrant the note on plate 26, "most of these tiles were set to scale, and drawn out on the spot, together with a great part of the tower." Accidents, and missing them by hairbreadths, are not unlooked for in such operations. Mr. Neale gives one suggestive sample a place in his carefully-laboured descriptive text (page 17),—"During the heavy gales in the spring of 1873, whilst standing on a ladder sketching one of the grotesque heads of animals, above the Decorated clearstory arcade on the south of the nave [given on plate 60], at a height of over 70 ft. from the ground, a sudden gust displaced the ladder. Its fall was fortunately impeded for a few moments by a projecting wooden spout, before it slipped down on the aisle roof, and I was enabled to reach that roof with but little injury." The vivid memory of such struggles with cooling breezes, might take the place of "thinking on the frosty Caucasus," whilst crawling in "fantastic summer's heat," through the lead-covered roof of the Sanctuary aisle,—in search of facts for plates 38 and 42. "All the roofs were measured by lantern-light, and this aisle-roof with much difficulty, owing to its low pitch" (p. 29). A Fahrenheit thermometer bore witness to the successful action of the sun's rays by going up to 130°; and the recognised measuring costume, —a plasterer's blouse, with continuations to match,—to the strait and dusty nature of those rarely-visited shades.

The main forms in the stained glass (plates 24 and 25) were traced on Whatman's drawing-paper, rendered in line on the spot, and thereafter reduced to about five-eighths of the real size by photography. The heraldic methods have been followed to some extent in the plates, and the stronger tones of colour suggested by the usual variations in hatchings and dottings. The painted decorations on the wooden vault of the Sanctuary, some 63 ft. from the ground, were traced (for plates 35, 36, and 46) on very transparent French tracing paper, secured to the boarding. These fifteenth-century decorations are of considerable size,—about 9 ft. by 6 ft.,—for each division of the vault; and there is powerful character of design and drawing in foliage and formal decoration, thoroughly decorative treatment of the whole, and admirable colour. Still well-built birds and beasts, on well turned and jointed limbs, appeal with advantage to the severest sticklers for the universal talents of other days.

In dealing with another point, curiosity led to a comparison of plate 44, with another drawing of the same arcade, in a volume which has been a standard text-book now just upon thirty years; and to the noting of ten discrepancies between the two,—in forms of mouldings, stoppings, and minutiæ of construction. The actual arcade was examined, and plate 44 won on every point,—which is testimony, pretty conclusive in its way, of the presence of a spirit of minute observation,—constantly endeavouring to get behind the mind of the architect, and the mason, and to discover all their reasons, and their methods. The wording, — "the jointing of the masonry to be *particularly marked*," — of the instructions for the silver medal of the R.I.B.A. may be responsible for some of the prevalent love for very heavy joint lines,—perhaps for some of the tendency to give very careful representations of slovenly workmanship, or constructive failures in old buildings, which would have been passed over very lightly a generation ago. Mr. Neale cannot be accused of forcing anatomy on the eye to the injury of the art;—nor of winking at all little weaknesses, as of the thirteenth-century builders, shown in the ashlar spandrels of the triforium on plate 12. Carving, shattered out of recognition, is "carving broken away" (plate 23, &c.); and missing shafts, &c., appear in dotted outlines only, as on plates 9, 12, and 14; but mere irregularities, and crippled lines due to bulges, are not noticed. The resolution has evidently been to show with much fidelity the building as the author found it, making only such judicious compromises as must be made in carrying through such a resolution. As restoration has been going on, difficult problems have cropped up where he has found parts of the building changing under his eyes, as noted on pages 32 and 33, and plates 42, 53, &c.; and these problems have been dealt with as they arose,—it is to be feared according to no cast-iron rule, but with a leaning towards the omission of all marks of modern work.

"The Monks' Watching-Loft at St. Alban's Abbey," the very admirable original drawing for plate 47, now hung as No. 1156 in the Royal Academy Exhibition, shows the resolution carried out with completeness. All the irregularities in the levels of the springing lines of the tracery, and in the widths of the panels are shown. In the central cornice some carvings are shapeless, the places of others are indicated by dotted outlines marked "gone." The record on page 31 shows why the upper cornice assumes so special a form:—"Some few years since, in the upper cornice, there were a number of shields bearing devices, but in 1874 these had been reduced to three. At the present time (1877) only one shield remains. The cresting—now destroyed—is partly illustrated from a fragment which, in 1873, when I sketched it, was in good preservation." Times of restoration, and times of neglect, have common and special perils.

The original drawings for plan, elevations, and sections (plates 3, 4, and 5) were prepared to a scale of 8 ft. to an inch. The scale for elevations of bays of the nave, transept, sanctuary, &c. (plates 12, 17, 23, 28, 33, 38), was 2 ft. to an inch, as also that for the tower; that for the porches (plates 6, 7, and 9), and the slype (plate 30), 1 in. to a foot;—the same scale as for details of windows generally (plates 20, 22, 40, 41, 45, 53, 54, &c.), and for the arcade (plate 44).

At the present time, reproductions of such drawings for publication seem, as a matter of course, to be work cut out for one or another of the processes where reduction can be made by photography. Mr. Neale sums up the case for photolithography in prefatory remarks, no doubt written after experience had tested his convictions:—"Its advantages are (1) that the original drawings being made to a large scale, more detail and accuracy can be shown than if the drawings had been made to the reduced scale and (2) that the copies are facsimiles of *my* original drawings,—thus any chance of additional drawing or touching up by the lithographer has been avoided." The process hardly needs to be described at length. By the aid of the sun an accurate reduction of a drawing is obtained. As throughout this negative, the lines of the drawing reproduced are transparent, the solution, on the sensitised paper placed against the negative, is hardened by the action of light where the lines occur; and then the other parts are washed away by floating the paper in warm water. The transfer leaves lines in greasy ink on the stone, and wetting, inking, and printing take place as in all lithography.

In the reductions from the original drawings, an attempt has apparently been made to secure uniformity of scale for similar subjects,—the uniform size of the plates of course determining what the precise extent of the reduction should be. The 8 ft. to an inch of the general drawings has become almost exactly 20 ft. to an inch; the 2 ft. to an inch for the bays almost exactly 4 ft. to an inch. Some adjustments have been made by treating the margins of the plates as slightly elastic. Still, in reducing the porches (plates 6, 7, 9) to a scale of about 2 ft. to an inch, the quasi-procrustean process has resulted in three different scales,—the extreme variation being about 1-40th of an inch to the foot. The scales put on the drawings have been reduced with the drawings themselves, and tell at once, that the original drawing and camera have not been put exactly in the relative position, in which the size marked on the glass would have been exactly occupied by the image of the drawing. The scale of the carving,—where the smallest reduction has been made is three-fourths (·75) of the real size; the scale of the general drawings where the greatest reduction has been made is two-fifths (·4) of the original; and there are several intermediate varieties; details one-half (·5); mouldings one-third (·33); stained glass five-eighths (·625). In order to obtain proper proportion in the photographs, each ordinary plate was divided into two pieces, some plates into three, and the double plates into five or six. Junctions would be made in the interspaces between the subjects where possible, and then there would evidently be less demand for delicate management, than when a drawing was cut across again and again (plates 3, 4, &c.).

Photolithography,—as becomes a young giant now very powerful, albeit not mixing much in architectural matters till about ten years ago,—visits with penalties all who fail to follow good counsel. Plate 33, a very good drawing, but without sufficient firmness and evenness of line to stand reduction, has suffered in the process. Plate 26, a reproduction of one of the drawings for which the Silver Medal of the R.I.B.A. was awarded, was more striking in its original form. The surfaces between the lines were broader, and consequently the lines, expressing colour in the tile-work, did not overpower the outlines of the architectural forms; some of the colour and texture lines have coalesced, and disturbed the proper relation of form, shadow, and colour in the drawing,—still of much excellence, and as an architectural record of extreme interest. The same class of risk has affected plate 4. The buildings in the fore-front, being forced forward by increased elaboration of the surface, the very considerable reduction has drawn together lines originally widely separated. In part of plate 14—a greater degree of reduction has apparently been contemplated, and the lines come out unduly vigorous. Photography is itself responsible for some falling short at times,—as in the right half of plate 2, where a dull grey day probably prevented the lines being cut out as sharply as might be wished. Clean, firm handling,—force of line carefully regulated to suit the extent of the reduction proposed,—gives an air of mastery to such plates as 6, 7, 9, 12, 38, and to such detail drawings as plates 22, 57, &c.,—which could not be improved.

As a lithograph is printed on soft porous paper, the ink hardens in the paper, and does not set off. Tissue guards do not therefore make life burdensome in using plates 2, 3, &c., as may happen to a tender conscience using doubled plates of forcible steel engravings. Indiarubber backing secures a flat page for such plates of a total size of 22 in. by 30 in. These are not by any means mere odd and trivial details, interesting only to bibliophilists. The question of size has not a little to do with a work of this kind, as it controls the scale of the drawings, and consequently the thoroughness of the illustrations. The excellent qualities in Mr. Kell's lithography have already been generally mentioned; but one of the chief merits must not pass without special remark. The plates, in Mr. Neale's handsome folio, have about 90 superficial inches more area than those of the largest book of photolithographs hitherto published.

OTHER ILLUSTRATORS.

It now behoves us,—after telling this story of the volume from its inception to its binding,—to make, as promised, some slight comparisons with the labours of other illustrators of architecture. (1). Among books of the same kind one's memory naturally turns first to that on the same subject, the set of nineteen plates, each 26 in. by 19 in., engraved by James Basire in 1810, from the drawings of John Carter, and published by the Society of Antiquaries with a text by Sir Henry Englefield (mainly from Gough's notes) in 1813. No considerable finding fault with Carter's measurements is necessary; he was not responsible for the 600 ft. which (see page 626 of vol. xxxv. of the *Builder*) crept into the text, and troubled many souls for long. The main dimensions in his general drawings stand the test of comparison with Mr. Neale's very well. There are, indeed, errors about which a good deal might be said. Carter believed that the two westernmost bays of the ground story of the Sanctuary were open once, and only filled with modern blocking up. Mr. Neale's plate 33, and the remark (p. 27) thereon, must effectually dispose of this belief,—which might otherwise be stoutly defended by any one who had never thought of the forms of the aisles adjoining:—"The stones of the piers are bonded into the tile-work of the filling in; they were measured in 1873, when the old plaster was removed." Showing the cloister arcading wholly clear of the wall-face of the south aisle was another error,—and a very natural one if the drawings to scale were not carefully compared with the actual work. The strange relation of the wall-face of the cloister, to the general face

of the aisle wall is shown with much care on Mr. Neale's general plan, and by the south elevation, and plates 22 and 23. The notes on page 17 seem to be dictated by a desire to answer a puzzling question put in the *Builder*, p. 625, vol. xxxv.; but they might lead to further questioning and discussion, and the reasoning, which would go to explain the positions of the wall faces in the cloister and above it, is not hinted at. The duty of noting Carter's other misapprehensions may, for the present, be left thus imperfectly performed. The greatest defect is, that some of the details have been badly seen, and that, consequently, the expression of the architecture is changed. Mr. Neale's admirable drawings assist to a greater distinctness the memory, which holds well the effect of the actual work. Carter's would not have the same effect. Tracery and jamb-shafts are too clumsy; the true forms of cusps and of all carving are generally missed; and the absence of jointing gives an unconstructive and unreal character to the wall surfaces, arches, and piers. Mr. Neale has cleverly brightened his drawings by touches of sharp shadow, and has cut out the open arches by suggestion of shade, with which it would be hyper-fastidiousness to grumble; but broad and strong cast shadows, such as Basire used, we now think best avoided in such geometrical drawings. The greatest difficulty with which Carter contended has been eluded by showing only the work that is on one plane, or nearly so to have shown aisle and transept windows on the longitudinal section, and to have kept them well back from the main arcades without cast shadows would have been no easy task,—for the nearer surfaces are not entitled to much suggestion of colour.

(2.) L. N. Cottingham's first volume (1822) on Henry VII.'s Chapel contained forty-five plates, 23½ in. by 18 in., illustrating the exterior; and his second volume (1829) twenty-seven plates illustrating the interior. The original proposal was to have 110 plates in all,—"making an illustration more extensive, and more complete, than has ever yet been bestowed on a single edifice, in this or any other country" (Cottingham's Preface, 1822). The spirit of the architecture being well caught, the book is not likely to become obsolete: it may even be better appreciated, fifty years and more after its publication, than ever before. The restoration of the external stonework under James Wyatt was carried on from 1809 to 1822, and Cottingham no doubt took advantage of the facilities for measuring, as—let us hope—some one will now get the run of the scaffolds, in the Early English bays on the south side of the nave of St. Alban's. Plates 12 to 16 (Mr. Neale) show with much completeness of detail the bays on the north side. We have noted already the extent to which the easternmost of the south bays differ in size from the others. Narrower bays and sharpened arches were thereafter preferred, and similar spacing was used in the Decorated bays still further eastward. There are many obvious differences between the north bays and the two latest south bays: observable at a glance—in mouldings and other details. A parallel set of five plates would illustrate the changes which had taken place, and the other three bays on the south might, on more critical questioning, yield also contributions to architectural history. Henry VII.'s Chapel, having extreme external dimensions of 128 ft. east to west, including the vestibule, and of 78 ft. north to south, is not so large as many a parish church; the general design, and the talent of the detail, deserve, however, all the pains that Cottingham took, and all the plates he promised. One of the defects is the want of an easily-recognisable plan in the arrangement of the whole work,—the regular movement from west to east in Mr. Neale's plates is a particularly happy idea. Cottingham's illustrations, obviously resulting from genuine measurement, are all well laboured, and well figured, and on the whole well drawn, though cross-hatched to death in parts; and though rotten lines in the early plates evince weakness in the lithography. The author was fully conscious of the defects, mentioning with satisfaction his "improved knowledge of the process" when contemplating the second volume.

(3.) Salzenburg was sent to Constantinople, by the King of Prussia, when the repairs of St. Sophia were in hand in 1847-48, and in 1854 the great monograph with plates (2 ft. 2 in. by 1 ft. 7½ in.) was published at Berlin,—twenty-six plates being devoted to St. Sophia. About a dozen of the plates are engraved,—the others being shaded lithographs, and lithographs in colours, gold, and silver. The extreme dimensions of the mass of buildings being about 510 ft. by 390 ft. (reduced to 2 ft. 1½ in. by 1 ft. 7½ in. for the plan) call for a double plate, with a scale of $\frac{1}{20}$ in. to the foot. The same scale is used for all the general drawings,—which, as well as the engraved details, are very elegant, and touched with firmness and feeling.* The effect of the architecture is well given, though to some English eyes,—accustomed to well lettered and figured drawings, and much minute analysis of construction,—there may be some suggestion of vague generality. The mosaics occupy twelve lavish plates. Though in chromo-lithography 1854 is not 1878, the execution of plate 27,—the decoration of the narthex over the great door, the best of all,—compares well with the clever frontispiece of Mr. Neale's volume, printed from fourteen stones,—a reduced *facsimile* of a panel of the choir ceiling, brought into view in 1875,—the perfect finish of which has well repaid all the painstaking.

(4.) The Norwegian Government work on Throndhjem Cathedral consists of twenty-eight plates, 1 ft. 10 in. by 1 ft. 2 in., by H. Schirmer and F. W. Schiertz,—all engraved by our John H. Le Keux. The church, 350 ft. long, 84 ft. wide across nave and aisles, and full of characteristic design, would evidently supply material for a larger work. Some of the drawings are very beautiful, especially the rendering of the twelfth-century ornamental detail,—but detailed plans, elevations of bays, and complete details of parts, are almost wholly wanting.

(5.) The great monograph of Chartres,—*publié par ordre de l'Empereur*,—issued from the Imprimerie Impériale in parts from 1856, is a sample of the sumptuous works which French Governments encourage. The numerous plates,—produced by engraving, lithography in chalks and colours, and by heliogravure,—are 28 in. by 22 in.; for the architecture, carved ornamentation, and stained glass, under the direction of J. B. A. Lassus; and for the sculpture proper, and the wall paintings of A. Duval. The number of collaborators,—editors, draughtsmen, engravers, and lithographers, whose names appear,—is very considerable. The general drawings,—to a scale of ·005m. pour mètre (·06 of an inch to a foot English),—are of a splendour befitting the majestic cathedral. Its total length is only 440 ft., but the height to the ridge of the roof is 174 ft. By the side of a main mass of so considerable a height, the 378 ft. total height of the north-west spire has not all the force that might be looked for. The extreme height of St. Alban's tower Mr. Neale gives as 143 ft. 7 in., from the floor-line under the tower to the top of its parapet. As the top of the nave parapet is about 68 ft. from the same floor-line (the Sanctuary parapet about 78 ft.), the restoration of high-pitched roofs, rising 20 ft. higher as now proposed, must lead to some additions to the tower itself, if it is to retain its present power over the immense structures beneath it. Such subjects as the two towers,—the old and the new,—at Chartres, are honestly and thoroughly delineated. The rampant fidelity which marks nearly every plate of the St. Alban's volume, is, indeed, absent throughout. A curious inquirer has ascertained that the legend "measured and drawn to scale on the spot," or its equivalents, is repeated thirty-six times on the plates. Evidently no disrespect was intended to the other plates, but "protesting too much" has its dangers, even with such as Hamlet's mother. It must be confessed, however, that in such views as plates 19, 20, 21, and 22 of the south porch (Chartres),—all drawn by Gaucherel, and the two last engraved by him,—the leanings of a good deal of the work are evidenced. Air, light, and shade, and masterful drawing, are especially demanded by such subjects, where large-sized figures of a high order of art are not adornments only of the architecture, but indispensable portions of it. St. Alban's does not afford even an average number of specimens of figure sculpture. There are judicious and novel remarks by Mr. Neale on p. 34, with reference to the figures in the Lady Chapel (plate 58). These figures—probably unique in their position and treatment—are the only full-length figures that are parts of the fabric. The hand which shaped the grotesques (well sketched on plate 60) and some of the heads on the south of the nave, and one at least in the south transept might, one would think, have done some rare work. Lassus put much strength into illustrations of the stained glass. Tracings were made from the glass, and these were reduced,—frequently to one-sixth of the original size. The Tree of Jesse, the Life of Christ, and His Passion, filling the three great western windows of the nave, are given in full colour in chromo-lithography by Emile Beau. The central window—"The Life"—works out to the reduced scale, 6 ft. high by 25 in. wide, being given in five sections; the actual window is about 36 ft. by 12 ft. 6 in. St. Alban's is out-distanced here again; plates 24 and 25 have the merit of introducing a pleasant variety of subject, and of recording some pretty patterns of fifteenth-century glass quarries, and the building would not allow any one to do more;—once it may have rivalled Chartres itself.

(6.) The church at Monreale furnished ninety lithographed plates, 28 in. by 20 in., published at Palermo, in 1859, under Gravina's direction. Although this work could not be passed over in taking stock of notable illustrations of notable buildings, it would be difficult to put it into the first rank of our illustrations. The architecture of nave and cloister is not without a certain amount of expressiveness; but the architectural features did not take the first place in the mind of the designer, and the mosaic decorations, subordinating form to colour, have the same prominence in the volume that they have in the actual work. The general drawings, to a scale of 1-200th (about $\frac{1}{17}$ in. to a foot), are really diagrams,—to illustrate the positions in which the mosaics may be found; purely architectural and constructional details are not hunted down with fervour. Gravina at plate 22 gets clear of the architecture, and deals with the mosaics. As the scale is small, and they are too evidently ground out with patient labour, the illustrations fail to convey to the full the impression of magnificence, which might have been looked for from their number and unstinted completeness of finish.

(7.) A description of Sharpe's "Architectural Parallels" would be a lengthy paper; let us be contented with six notes:—(1.) The work was published in 1848, and contains 121 plates 22 in. by 15 in., with a supplement of sixty plates of full-sized mouldings. (2.) There was no intention to make a complete monograph of any building. The nave, choir, and south transept of Tintern have fifteen plates devoted to them, and out of these,—the largest number devoted to any building,—eight are perspective views. Parts of buildings,—such as the naves of Fountains, Kirkstall, Byland, Bridlington, and St. Mary's, York,—such as the choirs of Whitby, Rievaulx, Netley, Guisborough, Selby, and Howden,—have been selected, in order that a series of parallel examples, of different dates but of somewhat similar scale, should receive about the same extent of illustration. (3.) Fountains,—the largest of the churches,—is 358 ft. long inside, and 129 ft. across the transepts. Tintern,—the most completely illustrated,—is 228 ft. long, 151 ft. across the transepts, and 75 ft. across nave and aisles. (4.) The buildings are mostly ruined abbey churches. Out of the thirteen buildings most fully illustrated, the naves of Bridlington and Howden, and Selby,—the most perfect monastic church remaining in Yorkshire,—form the only exceptions. (5.) The views show, with considerable skill, and, no doubt, with complete literalness, the actual state of the buildings thirty years ago; but the geometrical illustrations are all restorations. Fountains,—roofless, with shattered aisle vaults, missing gable courses, and ragged fringes of tracery in the arch of the great west window,—reappears with completed vaults, restored parapets and gable courses, and all traces of the later window swept away, in order that a complete example of the twelfth-century architecture may be presented. This rule,—of drawing each building as it probably was when complete and new,—is followed steadily throughout. (6.) The drawings are almost all lithographs, drawn on stone under the direction of the author, and many bear such well-known names as R. J. Withers, T. Austin. . . . The admirable author and man, who thus expounded "parallelism" at the beginning and end of thirty years, always felt satisfaction when he saw that his lesson had been well taught, and that the example which he set of accuracy and fulness of illustration was well followed. This satisfaction can now find no expression for our ears. It is, however, still possible to link the present

* Some few of us may remember the reading, on February 5th, 1855, of an excellent Sessional Paper at the R.I.B.A., bringing Salzenburg's work under the notice of English architects immediately after the publication,—by that good servant of the profession and the Institute, Mr. C. C. Nelson.

with an earlier day by mentioning a well-known work, kindred in spirit to Mr. Sharpe's, of which the author is still living among us.

(8.) The 123 plates of "The Churches of the Middle Ages," by H. Bowman and J. S. Crowther, were published over four lustres since, and illustrate fourteen churches,—eight in Lincolnshire, two in Warwickshire, and four in other counties. They are almost all parish churches,—some of no great size: so that the class of subject prevents the work joining the highest rank of monographs,—however much its execution entitles it to honour. The grand church at Heckington,—the largest except Nantwich,—is only 171 ft. by 90 ft.; and not one of the buildings has that "guinea stamp,"—the possession of a triforium stage. Heckington comes in for thirty-eight plates, 21½ in. by 13½ in., and seven other buildings for between fifteen and seven. Grouping, by means of an index, makes the whole into an illustrated glossary,—showing the treatment of parts of buildings at different dates; and, not the less, the variations from solidity to lightness, the methods of grouping, &c., in such buildings, through a century and a half. The early forms of true Pointed art at Frampton pass into the Transition towards Geometrical in Etton; Threckingham affords a rare tower and spire in Geometrical; and there is very fine fully-developed Geometrical at Temple Balsall. Ewerby and Heckington, with parts of others (Frampton, for instance), deal fully with the perfect work of Curvilinear date, which had the best affection of the authors. Cley-next-the-Sea is followed by Nantwich, which brings some characteristic Perpendicular on the scene. The chalk lithographic views by G. Hawkins do not interest so much as the well-measured and well-drawn line drawings,—plans, elevations, and sections, details of windows and doorways, arcades and buttresses, and a general collection of mouldings,—leaving in the instances of full illustration little to wish for. The buildings are a little restored into comeliness, as then seemed proper in all eyes in such drawings. The "get up" shows some influence of "The Parallels" in minor matters, such as the broad, black shadows in the figure-drawings, with very slight suggestions of shade. The signatures of the bright, clean drawings on the stone are not without hints in their way. The name of James Fowler (now of Louth, and well famed) is appended to careful draughtsmanship on the plates of Heckington, Nantwich, and others.

These reminiscences might be enlarged to almost any extent by casting a wide enough net,—not that such examples of the completest sort of English illustrations are not all too rare; but enough has been done to show things in proportion, and to stimulate memories. It will be seen that Mr. Neale belongs to the English type, acting under his own direction, and obtaining no direct aid from Government or monarch; also that he has shown what may be looked upon as English leanings and preferences in other things. The new book on St. Alban's is neither in superficial dimension, nor in number of plates, the largest, nor in style of production the most magnificent of the modern architectural monographs, but it must be regarded as belonging to those of the first rank, and fairly entitled to a place among such as those brought forward for comparison. In some respects, indeed, it can claim to be considered unique among English books of its class. It supplies the most thorough set of such illustrations yet produced among us,—illustrations of the entire fabric of one of the greatest of our Mediæval structures, of immense extent, with parts of many dates, and singularly full of varied detail. The analysis of architectural details is exhaustive;—such perfect completeness as is shown in the illustration of the porches, for instance, makes plates 6 to 11 models, that care and skill will not really surpass. The drawings, as we see them, are, moreover, in every sense the real and unaided work of the author. We ought not to omit to join thanks to commendation for a considerable task well performed, and to wish Mr. Neale, in his career as an architect, the good fortune that should properly follow studies so earnestly pursued, and already so fruitful.

Parbold.—The foundation-stone of a new church at Parbold, near Wigan, dedicated to All Saints, was laid on the 7th inst. The church will seat about 300 people. It consists of nave, aisles, western tower, and spire, and is being erected by Mr. Hugh Ainscough, of Lancaster House, from the designs of Mr. Edmund Kirby, architect, Liverpool.

KILLING AND WOUNDING ON THE PLATFORM.

IN what respect does preventible fatal accident differ from manslaughter? Not at all, we have always maintained, in its moral aspect. The crime is the same. But the difficulty that arises regards the identification of the criminals, and, very often, the criminality has to be divided over so large a number of persons, that not only is punishment out of the question, but the sense of responsibility itself is frittered away. There are many cases of manslaughter in which society is the criminal. An appreciation of this truth, in fact, underlies all recent efforts to protect human life and welfare by new legislation. Such is the case with regard to public health, to the seaworthiness of vessels, to the safety of miners, to the guarding of machinery in motion, to the fabrication, store, and carriage of explosive substances, to the construction and working of railways. Our statute-books are laden with numerous measures passed within the last few years on these topics; the preamble to each of which might have been expressed in the language,—"Whereas it is the duty of the State to take heed that none of its citizens suffer death from the neg'ect of proper precautions for public safety."

It may be difficult to form an accurate opinion how far this view of the case has come to form an integral element of public conscience. The spread of the doctrine has been slow. And, as is so generally the case in England, it has rather been as question of detail than as question of principle that it has made such way as is really the case. It is desirable that the matter should be looked at in block. The old idea was, that no one had a right to meddle with the internal arrangements of a house, a factory, a mine, or an establishment of any kind. A man had a right to his own opinion as to draining his house, or calling in a doctor to his child, or allowing his workpeople to run more or less risk. One by one all these items of the personal liberty of the individual to do all the passive harm in his power have been broken down. But we are yet far from the state of things when it shall be inscribed in large letters on every church, market-place, factory, public hall, or other place where men congregate,—"England expects that every man shall do his duty in preventing all preventible calamity that threatens himself or his fellows."

If this ever were fully brought home to the public conscience—that is to say, to the private conscience of every individual, we should put a stop to a class of terrible sources of personal injury which strike down more than two daily victims. Of what are called "platform accidents on railways," the number that has occurred during the years 1872—1875 has been steadily on the increase. From "falling between the carriages and platform," and from "falling on to the platform, &c.," 264 passengers have been killed, and 1,026 injured, in those four years. During the same period seventy-seven railway servants have been killed, and 165 have been injured, by "falling or being caught between vehicles and platforms." The numbers seem at first sight to tell heavily against the passengers as compared to the railway servants. But on reflection, the balance turns rather in the other direction. The number of the railway servants in 1875 was estimated at 280,000. The number of passenger journeys in that year was 1,363,000 per diem. By this latter figure, therefore, we have to divide the number 1,290, while the number 242 has to be divided by 280,000. Thus, while the fraction $\frac{1290}{1363000}$, or ·00093, represents the risk of the passenger from this class of accident, the fraction $\frac{242}{280000}$, or ·00086, represents the risk of the railway servant from the same cause. And as the latter are exposed to the risk for the whole period of the day, while the latter are only on the average travelling for about twelve miles, the actual individual risk appears to be pretty evenly distributed. The familiarity with danger that breeds an unwholesome contempt, in the case of the railway servant, may be set off against the nervous alarm of the inexperienced passenger. But the above features deal with only a portion of the case. During the four years in question, 138 passengers were killed, and 98 injured, while crossing the line at stations; 618 servants of the companies were killed, and 602 were injured, "whilst crossing or standing on the line." These figures, treated as before, give the decimals ·00017 and ·00043 as the respective co-efficients of casualty from crossing the line in the case of the railway passenger and the railway servant.

With regard to the latter cause of death or wounds, we have thus almost exactly a daily casualty arising from a source of danger that is almost wholly preventible. This class of collisions arises almost entirely from the habitual disregard of regulations. At almost every railway-station we see placards prohibiting the crossing of the rails. At every station we see the servants of the company disregarding the injunction. At many we see them aiding the passengers to do the same. Either the placards should be removed, and the passengers openly told to look out for their own safety, or the regulations should be enforced on passengers and servants alike, even at the expense of some increase of the staff of the latter.

The platform accidents, including the catching between carriages, are nearly the same in total amount, though differing in distribution, as those above considered. During the four years under notice they amounted in all to 383 per annum, against 364 of the crossing accidents. It is to these platform casualties that public attention has recently been so sharply called by the killing of a venerable and benevolent gentleman, whose loss many persons have deep reason to deplore. And hardly is Sir Francis Goldsmid laid in his tomb, before the Board of Trade are presented with the report of Colonel Yolland on the death of William Searle at the Turnham-green Station of the London and South-Western Railway while attempting to enter a passenger train belonging to the Metropolitan District Company. These two deaths are directly attributable to sources of danger which have been distinctly pointed out. They were both within the category of preventible deaths, if proper precautions had been taken. Were the railway companies independent of any control, and were the application of penalty in case of injury as sharp and sudden in this country as is the case in France, a verdict of manslaughter would have been returned against the directors, engineer, and manager of the line on which the deaths occurred in each case, and against those of the company owning the carriages composing the train in the case of Searle. As it is, the control of the Board of Trade, as sanctioned by Parliament, is just sufficiently effective to remove a very grave legal responsibility from the parties concerned, while it has proved to be utterly inefficient as to removing an ascertained cause of danger.

It is here, then, that it is desirable for the public to be more fully acquainted with the facts of the case than it actually is.

The floors of our railway carriages are on an average from 3 ft. 6 in. to 4 ft., or even 4 ft. 1½ in., above the level of the rails. To climb up this height is not, indeed, quite so hard a task as to climb to the top of a coach. But it is far more serious an undertaking than it is to enter the inside of a coach or carriage, with which operation the conveyance of the first and second class passenger may be most properly compared. To assist the climbers two steps are usually attached to the carriage, one at the height of about 2 ft. above the rails, and the other a foot higher. In many carriages one or both of these steps are replaced by a board running the whole length of the carriage. For the convenience of passengers, however, the great appliance is the platform. From the earliest commencement of the carriage of passengers on railways it became clear that a roofed space, containing a platform affording an easy entrance to the carriages, must replace the old footway, or gateway of the inn yard. As railways sprang up under the care of different engineers, each jealous of his own opinion, and perhaps too regardless of that of his brother, different ideas were adopted as to the platform. On the Continent generally,—certainly on all the Italian railways,—the level of the platform is only some 10 in. above that of the rails, and the dwarf side wall which supports it is 2 ft. 7½ in. from the rail. There is thus left a height of a yard or more for the passenger to climb. At the same time it is almost impossible for any one to be entrapped between the steps of the carriage and the platform. And every one being accustomed to the same method of entering a carriage, accident from expecting one thing, and meeting another, does not arise. And on the railways of Italy the wise provision is made compulsory that the passenger platforms shall be 18 ft. wide at the least.

On the English lines the arrangement of the platform varies to a great extent. This variation

is the direct cause of many casualties. It would be better for the public that the worst form of platform existing among us should be made normal, than that this variety should exist. But the travelling public have the right to demand that the best form of platform should be made normal and compulsory.

On the South-Western line, on which the two fatal casualties referred to took place, the usual height of the platform is 1 ft. 9 in. above the rails, and the platform-wall is at a distance of 28 in. from the rail. This allows of a clearance of some 3 in. between the step or longitudinal board and the platform, a clearance which is enough to make the ascent of the carriage more difficult than if less room were left; far too much for the mere requirements of running clear; and entirely inadequate to afford any possibility of escape to any one falling between the platform and the train. A more general and more convenient height for the surface of the passenger-platform is 2 ft. 10 in. above the rails. This only requires an ascent of about a foot to the floor of the carriage, which is a great convenience for entering, and still more for quitting, a vehicle. But there is no doubt that the comfort and safety of the passenger have been more fully provided for by the original platforms and carriages of the Great Western Railway than on any other English line. Mr. Brunel not only raised his platform to the level, or even a little above the level, of the floor of the carriage, but he made the planking or flagging to project over the side wall, so as to come close to the side of the carriage. All that was needful by way of clearance was, that the carriage-door should swing clear above the surface of the platform. The maximum of comfort was here combined with perhaps the maximum of safety. At the same time the platform-wall could be kept so far from the rails that a child, or even a man, might lie between the two uninjured by the passage of a carriage.

Neither the general reports to the Board of Trade of the accidents which have occurred, year by year, in the United Kingdom, nor the report of the Royal Commission on Railway Accidents, is so framed as to enable any one to institute a comparison between the relative safety of different lines. It would almost seem as if the tables had been expressly drawn up so as to obviate the possibility of any such comparisons. If the accidents of each class were distributed not only per class but per line on which they occurred, a very simple calculation would show the relative safety of different arrangements. When extended over a series of years, such a comparison would prove in the highest degree instructive. Thus, in the case of platform accidents, if they were distributed according to the lines on which they occurred (which it would have been easy for the reporters to do), and then reduced to a ratio proportionate to the traffic, we should at once obtain a valuable indication as to the relative amount of protection to the passengers afforded by each of the systems above indicated, or by any modification of the same. We should incline to the opinion that the Great Western system is the safest employed in this country, although fewer grave, but possibly more light, accidents would occur on the low Continental platforms. But this can be little more than a guess, in the absence of that digestion of their own returns which the Board of Trade have not taken the trouble to make. Again, we should hold that while the mode of involving the travellers in the most danger is to allow different heights of platform to be adopted at the caprice of each manager, the 21-in. platform is the one which combines the greatest amount of danger and discomfort with the least advantage of any kind. Here again, however, it is desirable to have the verdict of statistics.

The question of continuous foot-board is not altogether independent of that of construction of platform. The Royal Commission on Railway Accidents assert "there are only two ways by which accidents of the first class (falling between carriages and platform) can be wholly prevented; namely, either by abolishing platforms altogether, or else by putting it out of the power of passengers to open the doors of railway carriages, and excluding intending passengers from the platform, save when the train is at rest. One or other of these systems is adopted on some Continental railways, but public feeling in this country would be so opposed to the introduction of them here that the attempt, even if practicable, would be undesirable." Of course, if there be no platform there can be no fall between a platform and a carriage, but it is almost trifling with a serious question to make such a remark as this. It is incorrect, as far as our knowledge of Continental railways goes, to speak of them as having no platforms; although we have said that these constructions are generally very low. "But a third alternative," the Report goes on to say, "already resorted to by several railway companies, would, if generally adopted, do a great deal to lessen the evil; and that is the provision of continuous footboards of sufficient width. Objections of different kinds are urged against the use of such footboards, but we confidently believe that the companies will come to acknowledge universally that they are desirable. We therefore recommend that the Board of Trade be empowered to enforce their adoption whenever the circumstances of the traffic are such as to render them necessary for the safety of passengers." With all respect for the Royal Commission, the above is but a hasty and superficial statement. Who is to judge of circumstances such as to render footboards necessary? If this is to be remitted to the Board of Trade to decide, it should be so stated in plain terms. The recommendation as it stands is too vague to have any utility. Few persons who have had to climb from the ground, or from a very low platform, on to a railway carriage, will gainsay the fact that a continuous footboard is a great convenience and advantage. But it may be fairly doubted whether this is the case with two footboards, one above the other. And if it be only the lower step, say at 2 ft. from the ground, that is replaced by the continuous footboard, as in many of the London and South-Western carriages, the expedient becomes comparatively useless, if not a source of danger, in the stations. In order to mount from a 21-in. platform into a carriage, the comfort of the passenger requires that there should be a continuous footboard between the level of the platform and that of the carriage floor; that is to say, in the place of the upper step. But in case of having to enter or to leave a carriage in a spot where there is no platform,—a case which occasionally occurs, and which has proved a fertile source of accidents,—an upper footboard, whether accompanied by a lower one, or by lower steps, would be a serious obstacle. Again, the lower footboard is within 1 in. or 2 in. of the level of the platform, and some 3 in. from it, so that it is more likely to perplex than to aid the descending passenger; or even to catch his foot against the platform edge.

The original purpose of the continuous footboard was to allow the guard to pass along outside the train while in motion,—a proceeding which should be altogether discouraged. As far as the passengers are concerned, the footboard is a doubtful convenience, for the reasons before given. But if the stations be so built that the floor of the carriage shall be approximately on the level of the platform, allowing only fair clearance for the carriage-door to open, the question of steps or footboard is deprived of any importance. Neither will be used by the passenger except in case of a train stopping out of a station. And another advantage is possible, which would carry out a requisite for safety, at which the Royal Commission hint, although they gave no hope that it is practically attainable.

It would be perfectly easy, in the case of a platform approximately on the level of the floor of the carriage, to provide a wooden or metal rail at or close to the edge of the platform, which might be readily raised for 3 in. or 4 in. from its level. The increasing application of hydraulic power would make the management of this moving rail perfectly easy at great terminal stations. On line stations it might be moved by hand. The normal position of this rail would be the elevated position. The result would be, that whenever a train came up to a platform it would be impossible to open the door of the carriages until the rail was lowered, which should not be done by the station servants until the train was at a stand. In the same way the raising of the rail on the departure platform should be made a *sine quâ non* before the engineer was allowed to start. Thus every attempt either to enter or to leave a carriage in motion (except by jumping through the window) would be rendered physically impossible. By this simple expedient one considerable source of distressing injury, and often of fatal disaster, would be entirely abolished.

One objection only could be urged: "You are putting the companies to great expense." It is to be questioned whether the application of a guard of this kind to every station platform would cost more than the fitting of footboards, on one agreed model, to the 10,500 carriages now running on our lines for the conveyance of passengers. But we demur to the weighing of human life and limb in a balance so fine as this against pounds, shillings, and pence. The reasonable protection of human life is a duty to be enforced on every commercial company. Just as we are interfering with the owners of steam machinery to compel them to place proper guards, in order to prevent the accidents that occur, however rarely, to their operatives, must we compel the carrying companies to place proper guards to prevent a class of accident which injures at least one individual per diem. Let it be done, by all means, as cheaply as possible. But done it must be, or we fail to prevent preventible homicide.

Countries far younger than England in the introduction and use of railways are far in advance of England in the appreciation of the eventual importance of unity of system. The railways of Italy communicate with those of France and of Germany, or at least of Austria. There is a difference of ·55 in. between the French and the German gauge. A commission was appointed in 1871, by the Italian Minister of Public Works, to draw up a series of regulations for the normal dimensions of the Italian railways. Not only the gauge of the way, but that of the wheels, the widths and thicknesses of tires, the depth and width of flanges, the height and distance apart of buffer rods, the diameter of buffer heads, the height and minimum width of both passenger and goods platform, and their distance from the nearest rail, are all fixed within narrow limits by this Commission. The details were revised in 1877. A template was also drawn up, showing the fullest dimension allowable for any part of a vehicle allowed to run on an Italian line, from the height of the chimney to the width of the most prominent step or footboard. A width of 10 ft., and a height of 14 ft. 3 in. are allowed for this profile of the train, and a clearance of 6 in. must be left between any structure connected with a railway, and the most prominent part of the template in question. Once for all, a series of minute regulations is thus laid down by Government authority. Every railway engine, and every builder of carriages or engines, is provided with these regulations. Any vehicle that departed from the rule would be refused entrance on an Italian line. Thus, at the expense of a certain amount of trouble, taken once for all, that degree of uniformity which is essential to the public safety is secured for the railways of Italy.

The traffic in the railways of the United Kingdom is the heaviest in the world. With nearly a million and a half of daily passenger journeys a loss of two persons killed or wounded per diem by platform and local crossing accidents may not seem much. But it is an unnecessary loss, and therefore is of the nature of manslaughter. Whatever may be said of train accidents, these two classes of casualties may be, and therefore ought to be, effectually prevented. We make no special claim on behalf of the safeguard which we have now suggested. If a better and a cheaper one can be proposed, we shall be the first to prefer it to our own. But we are anxious to do what lies in our power to awaken a healthy action of public opinion on this subject. We wish to call to mind the fact that the risk of human life, wilfully and unnecessary incurred, involves a great responsibility. Primarily, no doubt, that responsibility weighs on the managers of railway traffic. But in a country where public opinion is so freely outspoken, a great share of the responsibility lies on the public. A railway manager may be excused, if he is not justified, by the plea, "The public have made no demand for this or that measure of protection." Therefore we wish to tell the public plainly that unless certain changes are made, two preventible cases of slaughter or maiming are likely to occur daily. We venture to suggest a method of making at least a portion of those casualties impossible. The neglect of that proposal can be only justified by the substitute of one that is better. Meantime there is a daily victim to the want of the Platform Guard-rail of the *Builder*. The suggestion comes from the engineer who first put bars to the windows of railway carriages; and thus, at the expense of some disfigurement to the vehicle, prevented what on certain lines would have been a certain cause of fatal disasters.

ARCHITECTS AND THE PUBLIC.

As will be seen by our report elsewhere of the meeting of the Institute last Monday evening, Mr. Chatfeild Clarke's short paper on the wrongs which the architectural profession have received at the hands of the English public failed to elicit any exhaustive discussion of the subject on the part of the members of what we suppose may be called, on Mr. Clarke's showing, "the suppressed profession" (as Mill called women "the suppressed sex"). On the whole, we must say that, while there was everything to approve in the moderation and tact of the few remarks with which the President closed what would have been the discussion if there had been any, we are of the same mind with the member who succeeded in shutting the lips of his brethren by a decided expression of opinion that it was unwise and in bad taste to discuss the subject on such an occasion. Such a discussion could not have done any good in convincing the public of their injustice (supposing it to be injustice), and as far as the architects themselves are concerned, it could scarcely have resulted but in one of two things: either a great blowing of their own trumpet on the part of the representatives of the profession, and declaring that they did not care a straw what any body said about them,—not they; or else in an admission that the public censure spoken of is justifiable, and that they would do better in future; and though that would be (under the supposed circumstances) a very proper and Christian attitnde of mind in itself, it may be doubted whether any body of professional men are called upon to admit themselves wrong, and humble themselves before that many-headed and not very reasoning monster, the public. If the architects are convinced that they are in need of improvement, the best plan is to begin to improve at once; but there is no need to put weapons into the hands of those who are so ready to accuse them.

As, however, we are in some sort the unprejudiced (we hope) mediators between the profession and the public, ready to represent the interests of either when circumstances call on us to do so, there is not the same objection to our offering a word on the subject. We may be allowed to say, in the first place, that though brevity is a merit in a paper, we are a little disappointed with Mr. Clarke's rather slight treatment of the subject: the paper certainly left, as the President observed, plenty to talk about, but did not say very much as to the reasons and motives of the complaints made against the profession, or the degree in which they were reasonable, nor as to the manner in which they should be met. Now, we take it as a fact that there is a good deal of disparagement of the architectural profession going about at present. It is perfectly true, as was observed, that other professions are spoken uncharitably of; the doctors and the lawyers, for instance; but it is not quite in the same way. There are plenty of current witticisms and cynicisms constantly to be heard at the expense of those professions, but these are mostly in private talk and in a spirit which is obviously only half-serious. There is not the seriously-intended depreciation and sneering in the columns of public prints to which the architectural profession is not unfrequently exposed, and which is hardly to be found directed, with equally heavy guns, against any other eminent profession. In regard to private feeling, we are inclined to think that the architects are as good favourites with the best educated class of people as any other body of men,—among those, at least, who have no interest in depreciating them. The majority of private persons speak of the architectural profession, as far as our knowledge goes, with a great deal of respect, and regard it as an honourable and fascinating one. Those who say otherwise are mostly either those who are closely connected with engineers (and who invariably run down architects), or those who merely believe and repeat what they see in the *Times* or the *Pall Mall Gazette*, or elsewhere, and who would be equally ready to be complimentary if the papers from which they take their opinions led the way. The detractors are the papers and the Government officials, whose opinions to a great extent the papers represent. And this public detraction certainly does exist to an extent which seems peculiar to this country. The fact is there; then comes the question, whose fault is it? Does the wrong lie in the shortcomings of the architects, or in the ill-nature or stupidity of their critics?

We should say that a considerable part of the blame lies with the public. The modern English public is a peculiar public. It piques itself on being "practical"; and its governing body, being to a great extent, in fact as well as in name, representative, piques itself still more on this same quality. And by this class of the public the architect is regarded as pre-eminently a man of taste; that is to say, a man who puts what he calls artistic considerations before practical convenience and suitability; and there is no character which is more antipathetic to the true Briton than this. Once let him be persuaded that any man or body of men are set upon inculcating taste upon him, and from that moment he views that man or that body with an unappeasable suspicion. He does not want all that; he wants something solid and tangible, and whether it is beautiful or not is a matter he can hardly think it worth while to consider; and unfortunately, but not unnaturally, the average Englishman's great mouth-piece, which lives by expressing his own opinions for him, the Press, is in this country (at least so far as the daily or newspaper press is concerned) the very incarnation of this feeling. The want of knowledge shown, as a rule, by the daily papers, upon subjects connected with art, and upon architecture more than any, is but a too palpable fact; and consequent upon this comes the readiness of editors to believe any literary person who chooses to libel architects and their doings—to admit into their columns any statements, however erroneous, which are sent over the signature of any scribe whom they choose to confide in—and their absolute indifference towards even allowing fair-play, often, to those who are attacked. In some leading papers it is notorious that anything said against architects is welcome, and that anything in their defence is grudgingly admitted, if at all. And this is in the main the result of this so-called "practical" tendency of the English mind, concentrated in the representative organs of the press.

On the other hand, there is no doubt that in a certain way the architectural profession does lay itself open to the charge of dilettantism, though this is justly incurred rather by a small but representative body than by the profession at large. The numerical majority of architects are really people doing steady practical work in a steady practical way. But there are those, who generally are put rather forward in the public mind as representing the tendencies of the profession, who certainly seem deliberately to lay themselves out to be sentimentalists in building, caring more to make a building realise a certain type which their minds approve than to think of its suitability for the purposes required of it. To engraft beauty on suitability is the bounden duty of the architect; to consider beauty first, and that only a borrowed, imitated, factitious beauty, is really, if we come to think of it, enough to give a reasonable excuse for putting him out of court. We cannot help thinking that here is really the rub between the modern architect and the public. They (the latter) want convenience and comfort, solid, healthful, and permanent building, in the first place, and if they find that they get these they may be led to care for beauty as well as for fitness afterwards. But the æsthetic architect wants beauty, or what he thinks beauty, first and fitness afterwards: he is first desirous of Gothic or Queen Anne, and then the other things may be added to it,—if he has time to think of them. As we have said, it is but to a few, numerically, that this criticism applies; but they are a few who contrive to be rather prominent, and whose aims are identified by the public, who can hardly be expected to discriminate such matters with much nicety, with those of the profession generally.

We should say that, in a sense, this position of things is rather encouraged and stimulated than otherwise by the action of the Institute of Architects itself, so far as it is educational. It gives medals and scholarships to young members of the profession to go and sketch and study old buildings, acquiring thus the habit of draughtsmanship and archæological knowledge, no doubt, but also inciting or confirming the mistaken view of the architectural profession as the art of reproducing old styles. If, instead of, or, at any rate, in addition to, scholarships and medals for the illustration and study of ancient buildings, there were the same rewards offered for the study of modern buildings and decoration, and sanitary and practical requirements all over Europe, with suggestions for their improvement, we should probably have a useful step in the direction of removing one accusation which is directed against the architects of this country. With which hint we leave the subject for the present, though there is unquestionably much more to be said about it.

GERMAN ART AT THE PARIS EXHIBITION.

THE German section of the Paris Exhibition—quite out of proportion to the space now taken up by the German Empire in the map of Europe and the position the German race has reached in the scale of civilisation among nations—was opened on May 11th. Almost at the eleventh hour the German Government decided to provide for the representation of German art, thus in some way relenting from and making amends for its unwise resolution to keep away from the Exhibition altogether. We should know the German people very badly if they did not resent this attitude of their Government, which prevented German industry from competing in Paris, and if they did not rejoice in its subsequent action to find a domicile in the great building on the Trocadéro and the Champ de Mars, at least for the art of Germany. It is a well-known characteristic feature of the Germans that they are never too proud to learn from other nations, demonstrating this by the great numbers in which they always have flocked to exhibitions; and they prove this again by the large influx of the Teutonic element already now reported from Paris, notwithstanding that German skill and handicraft are almost entirely unrepresented at the Exhibition.

The space occupied by the German Art Section is a hall about 120 ft. by 80 ft., lighted from above. The postponement of the opening of the section was due to the desire of the German officials to have everything ready and in its place before the public were permitted to view it—a mode of procedure much to be recommended. The impression created by an exhibition—whatever its size—when completed is much more effective than when thrown open to the public gaze in a half-finished state—a condition in which the 1st of May found a great many sections of the Paris Exhibition.

The German Art Section is located in the part of the Exhibition fronting the École Militaire. A portal of noble proportions in imitation black marble, surmounted by a medallion containing the Black Eagle and the inscription, "Deutsches Reich," and closed by cloth curtains, opens on a very large hall, one of the largest of the whole building. Its walls are covered by oil-paintings, the large space of the hall being filled by statuary of marble and bronze, between which are interspersed exotic plants. The blending of the white of the marble with the green foliage is very effective. The whole hall is covered with soft carpet, and chairs and seats are provided in abundance.

The centre of the hall is occupied by several tables, upon which are spread, round a few bronze statuettes, a large number of handsome editions of poetry and prose, enriched by photographs, water-colours, lithographs, &c., open to the inspection of the public. The number of oil-paintings is 155, and that of works of sculpture 23, without reckoning water-colours and other smaller works of art.

The selection of pictures made is generally considered to have been judicious, with a few exceptions; and although their value has been differently criticised, there is nothing absolutely flat or unblushingly vulgar. In picking out a few of the best works exhibited, one of the most striking is Karl Becker's "Dichterkrönung Ulrichs von Hutten" ("The Crowning of Ulrich of Hutten"), with a charming fair figure in the foreground, such as has been noticed in several of the painter's works before. Close to it is a sea-piece by Achenbach,—a bit of sea-coast near Flushing in stormy weather. Next we come upon an old woman busily applying soap and soda to a marble statuette of a Venus of Milo, probably in the studio of her master, whether painter or sculptor: a composition in which the contrast between the highly idealistic features of the small goddess, and the expression of the face of the servant, bent upon the prosaic task before her, is very striking. Fagerlin, of Düsseldorf, has a pretty painting, "Ohne Trost" ("Disconsolate"); Meyerheim, a dance of Indians on an American stage; Menzel, a scene from an iron foundry; Gusson, a work-room, treated in Makart's style, with his neglect of details. Of other pictures which cause people involuntarily to stop

by their attractiveness may be mentioned, on account of the grotesqueness of fancy pervading it,—although it is admirably painted,—a sea-monster, half-woman, half-fish, bending with glaring eyes upon the corpse of a handsome woman floating in the water. Close by is a cardinal, with harsh, strongly-set features, playing the piano, while a Madonna hung above it looks down upon him with a sad yet friendly smile. Near it is a painting by R. Nenneberg—"The Pursuit of Fortune,"—an idea as attractive for the brush of the painter as it is here powerfully rendered. Of sculptures, a small marble witch, by Cauer, of Kreuznach; a beautiful bronze group of Begas, the Rape of the Sabine women; and a number of portrait busts of German artists and men of letters, are the most remarkable. Crossing the German section longitudinally from the entrance, the Dutch Art Exhibition, which occupies several rooms, is reached through an open door.

The German Art Exhibition promises to become a favourite portion of the Exhibition. It has been greatly crowded since its opening, and there appear to be many buyers, some of them Englishmen.

LANDSCAPES, PORTRAITS, AND SCULPTURE AT THE ROYAL ACADEMY.

WE have only hitherto named the leading landscapes, and it cannot be said that the Academy is strong in landscape this year. Yet there are a good many things not to be passed over. The first room contains two couples of pictures that make very good pendants to each other, and are so hung with some effect: Mr. V. Cole's "Showery Day" (20), and Mr. F. Goodall's "Oxhey Place, Herts" (26), form a very good contrast between the fresh daylight effect of the first and the quiet twilight of the second picture, in which the painting of a group of red cows in the foreground, their colour toned down in the fading light, forms an element of interest: and at the further extremities of the same wall hang two works, which almost seem as if painted as companions, "Forest Scene, Evening" (9), by Herr Carl Rodeck, and "A Grove" (32), by Mr. Macartny; both consist of a canvas filled with trees with straggling snatches of sunlight between them, and have considerable feeling and effect, though we suspect the German artist owes his position on the line to the fact of his picture forming a good balance to that of the English painter, whose work, if looked into, is much more refined and studious in the drawing of the trees. Hung rather high over this set is Mr. Aumonier's characteristic and melancholy painting of "Waste Land" (28), a wild place overlooking the sea, and overgrown with weeds; as usual, there is much intensity and originality of feeling in this. How long are the Academy going to persist in hanging this really poetic landscape-painter where his works cannot be seen? A little work in the corner of the same room, with the title "Old and Young" (76), by Mr. J. White, should be looked at; the meaning of the title it is impossible to make out, but it is a very original and clever painting of a desolate-looking corner near some old cottages. These and other paintings we come across suggest the idea that, under the supposition that the beauties and pleasant aspects of Nature are worked out, there is now a kind of inclination among painters to turn to the desolate and comfortless corners of the earth, and see what can be made of them in the way of landscape effect.

A small painting, also hung high in the first room, "Derelict, the Morning after the Storm" (22), by Mr. Laurits Holst, is very successful in the general tone of the scene and the feeling intended to be conveyed, though the abandoned ship looks a little too steady and unmoved on the swell. To convey the idea of the motion and swing of a ship on the water is a feat in which few painters succeed: Mr. Hook did it wonderfully in one or two of his works, one especially, the title of which we forget, where the spectator was in the craft, and we really felt the swing of the boat under us as we looked at it; this is what Mr. Naish has attempted in "Devonshire Trawlers" (459), but it will not do: the boat is not moving. A clever and more successful attempt of the same kind is hung high up in Gallery VII., Mr. Bird's "Watching a Chance" (621), where a boat is waiting at the back of a heavy ground swell for a good chance of beaching; we see the receding wave that has passed under the boat and is going shorewards, and the cottages on the beach over the crest of it, in a very real manner. Hanging committees, we take it, do not know very much about this kind of thing, from the way they have several times treated works of this sort in which there were real ability and observation of nature. Mr. R. C. Leslie, who we remember ware a sufferer in this respect before, has, however, got deservedly placed on the line for his very able work, "A Last Shot at the Spanish Armada" (507), equally truthful in the painting of the great semi-transparent heap of water on the left, and the palpable "send" of the ship down into the hollow of the sea, so that we almost hear the roar of the foam under her bows. Another marine work, by Mr. Naish, "A Summer Sea: Scilly Islands" (110), is remarkable not for the sea, but for the rocks, which, in fact, form the main portion of the picture. Mr. Henderson's "Under the Sand Hills,—Full Tide" (98), has truth and reality, though the water is a trifle hard and mannered.

Of the various landscapes combined with cattle studies by Mr. H. W. B. Davies, it is difficult to know quite what to say; in the combined ability for landscape and cattle-painting they are exceptional, relatively speaking, and positively so in regard to the cattle, if we consider them as the works of an animal-painter; but the landscape is too important an element for them to be so considered, and yet it never seems to get beyond a certain point of smooth and realistic character; the work, for instance, to which the line "The lowing herd winds slowly o'er the lea," is appended in the catalogue (615), is absolutely destitute of any such sentiment as the reference to Gray's poem would lead us to look for. As a brilliant painter of foreground detail, as in "Mid-day Shelter" (134), Mr. Davies is more at home. A picture of a style of landscape very similar to that which Mr. Davies prefers (but without the attendant cattle), namely,, "Conway Marsh" (324) by Mr. Jos. Knight, affords an instance of the distinction between landscape in which the poetic element, so indefinable, yet so surely felt, is present, and that from which, as in the works we have just been mentioning, it is absent. For the absence of this quality of feeling, only extreme power and intensity of realism can at all compensate,—that kind of power which makes a poetry of its own in the sense of ability on the part of the painter; but such a power is rare. In Mr. Goodwin's beautiful little work, "The Pastures of the Higher Alps" (142), full of such delicate colour and aërial tint, we have an example of the kind of landscape which the Academy authorities try to keep out of sight, as in those of Mr. Oakes (all on the line) we see what they delight to honour: the conclusion is not favourable to the immediate future of landscape painting. Among that class of landscapes in which a peculiarity of local character is illustrated, Mr. Enfield's "Saltwater Marsh, near Tankerville" (342), where a long dyke stretches in perspective right away from the spectator, with pools of water on either side of it, is very successful, and makes a very good picture out of slight materials. Mr. Macullum is highly successful this year in his coast scenes, chiefly remarkable for the treatment of the water,—"Shrimping" (384), and "Waiting for the Ebb" (606); in the first, figures are wading about in a large expanse of shallow water; in both the effect of reflected sunlight on the water, perhaps partaking of mannerism, is nevertheless singularly brilliant and real. Mr. Colin Hunter's "Ebbing Tide" (409; far superior to his larger picture near it) is a good little work of the same type of subject. Miss Montalba's large Venetian picture, "The Last Journey" (424), would be named as a brilliant thing if it were our first experience of the artist; but, alas! manner, manner, manner; we know it off by heart already in these few seasons. Mr. Cecil Lawson's "Wet Moon, Old Battersea" (433), hung very high, looks good; and Mr. Meyerheim's "Changing Pasture" (471), where some cattle are coming through the middle of a field of high grass, has very fine qualities and is thoroughly individual in style. This kind of individuality, though with less unexceptionable execution, belongs also to Mr. Hugh Cameron's "Haymakers at Noonday" (554), painted in a very broad style; and not far from this we notice an apparently original and striking effect in Mr. Holloway's "Night on the River" (545); it is hung very high, and may perhaps not bear closer examination so well, but it certainly seems to have power of effect and handling. Mr. H. Moore is hardly himself in "Highland Pastures" (571), a hard painting to come from his easel, and which we should scarcely have credited to him. Among other works we may mention those of Mr. Wyllie, especially his clever and original, though rather eccentric, painting, "The Silent Highway" (951),—to wit, the river with a steamer coming along it, treated a little after the manner of the artist who paints "Nocturnes"; Mr. Meyer's "Picturesque View in North Wales" (592), Mr. Hennessey's "Summer Evening on the Thames" (1384); Mr. Clarence Whaite's "Thirlmere" (604), painted, like his picture in the water-colour exhibition, in direct reference to a recent Manchester controversy, and very hard though brilliant; Mr. H. Goodwin's "Old Venetian Palace" (349); Miss Kate Goodwin's "Old Rookery, Winchelsea" (355), and Mr. Ivystan Hetherington's "Summer-time" (1003), a very fresh and real little study.

Portraits are very much stronger this year than landscapes, and there is a smaller proportion than usual of that hopeless class of works which can only be regarded as filling so much wall-space. Mr. Ouless keeps his place completely, but does not altogether strike us as having made any marked step in advance, partly perhaps because he has not been so fortunate as some of his compeers in having subjects whose character is strongly marked, or who are of special interest to the public in themselves. His best work is, perhaps, the half-length of a gentleman (232), which hangs in the large room; but a fine one, also, is "Lieut.-Col. Loyd Lindsay" (65) in the first room; a straightforward, soldierly portrait, in which the simple grey coat and red ribbon are made the opportunity for some very refined colouring. The pendant to this is Mr. G. Richmond's "Marquis of Bath" (59), which is admired as a capital likeness, but in which there is too much of the satin waistcoat to be in entirely good taste, and the painter has not escaped from the old conventionality of a pedestal for the hand of the figure to lean on. Mr. Millais, besides the beautiful "Jersey Lily" mentioned already, contributes a really remarkable portrait of "The Earl of Shaftesbury" (242), one of the most concentrated pieces of character ever put upon canvas; it is painted for the Bible Society, and the whole history and *raison d'être* of that society, and the movement which it represents, seem to be summed up in the expression of this remarkable portrait. It is singular that the same artist who produced this work could in the same year send so comparatively common-place a portrait as the "Countess of Carysfort" (1021); but the fact is that Mr. Millais is always (and we may say only) aroused to his finest efforts in portraiture when there is something of interest, some large and important association, connected with his subject. The Jersey Lily had been the talk of London for her beauty; Lord Shaftesbury is the centre of a very large section of the religious world; in each case Mr. Millais rises to the occasion. Mr. Watts is different in this; he has produced remarkable portraits of great men, but he will put as much of his genius, almost, into the portrait of a sitter unknown to fame, if the head itself is suggestive. Thus in this exhibition there is more of artistic power and beauty in the painting of the girl's head called "Florence" (195) than in the portrait of "Mr. Lecky" (128), though the latter is characteristic enough in its way. His "Lady Constance Lawley" (189) is an attempt at a *spirituel* effect in the painting of a *spirituelle* sitter, who is clad entirely in white, treated in a kind of vague half-suggestive manner; the effect is a little too ghostly, on the whole. Mr. Wirgman, a young painter whose works we have previously mentioned with approbation, has produced a very original and refined work in his portrait of "Mr. Thornycroft" (28), treated in a peculiar key of colour, with very delicate greys and neutral tones, the only approach to positive colour being in a pair of orange-coloured gloves lying on the table; but even in these the colour is rather relatively suggested than positively shown. Mr. Wirgman's other portraits, in a much stronger system of colour, show that he is by no means bound to this method of colouring in a low key, but that this portrait has been a deliberate experiment, and a very interesting and successful one. Mr. Wells's "Mrs. Percy Chapman" (116), in a classic dress, and carrying a casket, is pretty, though hard and mannered. The fact of this being on the line, and Mr. Wirgman's first-named work put high up, is another of those contrasts between the privileges of Academicians and non-Academicians, new men and old, in which this year's exhibition is so instructively rife. Mr. Henry

Gibbs's head of a girl, called "A Portrait" (127), has force and character, and Mr. Storey's "Sweet Margery" (133) is a painting of a face of singular beauty, beneath a red-feathered hat, but it is too smoothed out and deficient in character as regards execution. A better portrait is the three-quarter length of "Lady Clayton" (526), finely drawn, and natural and easy in attitude,—also, however, a trifle hard. Mr. P. R. Morris, whose versatility this year we have before commented on, shows yet another style in the large full-length portrait of "Mrs. Frederick Leyland" (227), a blond figure, in tight-fitting white satin dress, relieved against a crimson curtain. There is a successful kind of *bravura* about it, but it has too decidedly the look of a show portrait. Mr. Otto Scholderer's "Young Girl in a Fancy Costume" (219), obviously a portrait, has much character, and should have been far better hung; and Miss Rosa Koberwein's head, "In Maiden Meditation" (362), representing a lady with white (or powdered) hair in a yellow dress, shows very skilful and agreeable treatment of colour. Mr. Archer has made a very happy hit in his "Miss Sylvia Schlesinger" (511), in a highly characteristic treatment of colour, exactly suited to the marked individuality of his sitter. The portraits of "Miss Meyrick" and "Miss Clara Meyrick" (385, 395), by Mr. Desanges, are very interesting, and form a finely-contrasted pair of pictures,—the one an indoor picture, with a dark costume; the other, an outdoor portrait, full of light and brightness, with which, indeed, the artist might well be inspired by so engaging a subject. Beneath these, in the same room, is Mr. Story's best effort of the year, a "Portrait of a Lady *à la* Rubens" (593), a painting of great force and brilliancy, and which grows upon one. Among children's portraits, which are so interesting when successfully treated, the best is Mr. Sant's charming little girl with a red belt (211), whose face has more colour than the artist now allows to his grown-up ladies; Mr. Orchardson's "Conditional Neutrality" (41), is a portrait of a boy also in a red sash, and backed by a yellow curtain; a somewhat eccentric but clever work. Another we noted as pleasant and characteristic is the little fellow painted by Mr. Weigall, under the title, "Going for mine Walk" (605).

Our review of the portraits leads to the conclusion that they are the strongest part of this year's exhibition, as the sculpture is undoubtedly the weakest part: indeed, the dearth of successful works of a high class is more decided than we remember for some time. The bronze bas-reliefs from George Herbert's poems, by Mr. Thrupp (1413), have some specialty of interest, but the execution is by no means equal to the conception. In the octagon, colossal figures of uninteresting people stand around, of which the best statue is Mr. Woolner's "Sir Thomas White" (1475), the founder of Merchant Taylors' School. "Whispering Vows to Pan," by Mr. Calder Marshall, is a prettily-modelled figure with some sentiment in it; and Mr. Lawson's "The Ramblers" is a very pretty sketch in marble. In the inner gallery the only one of the larger works that has any force or power in it is Mr. Lawson's group of a man struggling with a panther, called "In the Arena"; it is force of action, however, not of expression; and Miss Dubray's seated figure, called "Jephthah's Daughter," is fine in conception, but very roughly modelled. Among the busts round this room are terra-cottas of Mr. Calderon and Mr. Marks, by Mr. Adams-Acton, in which there is a good deal of spirit. M. Daragon's terra-cotta bust of "L'Abbé Testory" is very French and very finely finished, and in the same material Mr. Mullins has made an interesting study of the sad and worn countenance of James Martineau. Scattered about the rooms we find miserable nursery subjects: mothers urging refractory little boys to bathe, and all that kind of goodiness and bread-and-butter which is even worse in sculpture than in real life. And even in subjects of more imaginative character a prosaic veil seems to hang over everything. An eminent sculptor sends a half-size figure of "Godiva," appending in the catalogue the pretty verse of Herrick, ending,—

> "But Beauty's self she is
> When all her robes are gone"

(they are not all gone in this case); but there is absolutely no beauty in it: a commonplace plump woman, that is all. The very object of art is to raise such a story and such a figure to the level of poetry, not to reduce it to prose: but the spirit of commonplace seems to have presided over this year's sculpture even more uncompromisingly than usual.

MUSEUMS OF ARCHITECTURE, AND THEIR DIFFICULTIES.

THERE is certainly a something or other attractive about plaster. Plaster would seem to possess in itself a sort of power of doing what other and more valued substances do not possess. Some, indeed, of the most notable things in the way of art in the world have been executed in plaster, as the Moors in Spain have proved; and not a few of the more durable art objects have been cast first in plaster before their final rendering in more durable and valuable material. But there is yet more in it than this, for it would seem to possess a species of fascinating power over some minds out of all proportion to its apparent strength as a material. The Prime Minister but the other day was asked some questions as to a "National Museum of Plaster Casts," and they would seem to have puzzled him a little, for though he could not but allow the desirability of such a collection, and the utility of it, and the furtherance it might prove to things artistic,—said broadly,—that the "state of the world" and of things generally, all about us, did not really admit of the serious consideration of so vast an idea,—he sympathised with it, but the outer world had other and more immediately interesting objects before it! And that this is so none can doubt. And much might be said about it, but still in spite of all difficulties and all obscuring interests, a collection of the "art thoughts" of the past, even if but in plaster, would be a right good thing to see, and is worth a word or two now and then.

It might be somewhat difficult, putting aside this indifference, to find a way to a really hopeful commencement of this great work, for not only have the *casts* to be got, all untampered with, but there is, perhaps, the more difficult thing still to be found,—a suitable and large enough place for them. All the comparatively few things that are now available are scattered about here, there, and everywhere, as accident and fortune have willed it, so that to get at anything like a comprehensive view of what there is, say in London alone, very many places and collections, more or less widely apart, have to be visited, from the magnificent collection of antiquities in the British Museum, to the Soane Museum, the scattered collection at South Kensington, and the Architectural Museum collection of Gothic art,—the only one, indeed, to be found in this country, for in the great national collection at the British Museum there is not a solitary specimen of it. Other small collections there are scattered about; but all but inaccessible to the public, and indeed to the student. It might be impossible to bring these together, though duplicates of them might be obtained without any very great difficulties or hindrances. But even with all this, such collection would be not a little imperfect and faulty, requiring to be filled up at all points, needing beginnings and endings, and very much to make it at all complete and thoroughly fit for its purpose of presenting to the eye and mind of the student of art a general and comprehensive view of it. A large space would be needed for this; but England ought certainly to have a complete Museum of Sculpture and Architecture.

In any future general art arrangement, and it may, perhaps, be a distant future, we cannot but think that architecture, as a fine art, should take the lead, and guide to the arrangement, both chronologically and in order of place and position; and that sculpture,—to use that general term,—should follow and illustrate it, and so form part of it. Art is in reality one and indivisible, and architecture, sculpture, and painting should be linked together. In the great eras of art they were so, as all history and art precedent proves, from the earliest and rudest times to those of the Renaissance; so that sculpture at least,—using that word in its widest sense, and as comprehending "ornament" as well as statuary, should not only be present, but should be so placed as to indicate the purpose for which it was wrought. We would urge this as a general and comprehensive principle, and the more so as it has nowhere been acted upon, or even hardly thought about, sculpture being always dominant; and admitting architectural and constructive forms only as quite subordinate, and as parts to be put out of view indeed as much as possible, to admit them at all! We need but point to the British Museum in proof of this, and note how very scanty the architectural forms are, and how few, at least until very lately, had any place. And as it is, so little are they considered, or perhaps understood, that many of the details of architecture there may fairly be said to stand on their heads!

It may, perhaps, be useful and convincing to point to one or two examples of the "ruling power,"—if we may use the term,—of architectural forms, and even minor details, as mouldings, and as making more expressive a work of sculpture. We allude first, by way of proof, to the world-famous *metopes* from the frieze of the Parthenon, and of which there are sixteen in the British Museum, *fixed*,—somewhat unfortunately, as we think,—into the north wall of the "Elgin Room," as it is called, and thus forming all but a component part of the room itself. These metopes represent a series of single combats, or encounters between the Lapithæ, or Athenians, and the Centaurs, and nothing can surpass the magnificent way in which the work is executed. So individualised is the handwriting, or art-writing, on the marble, that you may all but see the great sculptor at his work, or rather sculptors, for there were more than one. And in looking at them, and at each individual panel, one cannot but regret the total absence of all their architectural surroundings, as the *triglyphs* between them, the mouldings under them, and more than all at the want of the great crowning *cornice* above them, and which in the temple itself forms so striking and characteristic a feature in it. The purely architectural details of this Greek temple are as finely wrought as the great sculptures themselves, and if *artist-workmen* ever did exist, and work, why here is the evidence of it. If not so, it is nowhere.

Let it be observed here, that this consideration will help to make our argument the clearer, especially to those who have not thought much about it. The strictly-architectural parts of the great temples of the old Greeks are to the full as fine in their own way as the mighty sculptured forms themselves. Nothing would seem to have been missed or lost sight of, and the workmanship cannot possibly be surpassed,—nay, might we not almost go the length of saying that without the "architecture" of the temples, the sculpture, great and individualised as it is, and descriptive of the Greek mind, and hand, and thought, cannot fully be understood? We would here point not to the Parthenon details only, but to those from the small Ionic temple of the river god, Ilissus, of which there are many scattered fragments; and to the larger temple, also Ionic in order, of Apollo in the same gallery. Note only the working of the scrolls of the volute of the capital.

We might thus go on and point to a number of details purely architectural which would prove, if any proof be indeed needed, that very much is lost to the sculptures here by the absence of the architectural forms, and by the neglect of those who, like Lord Elgin, took the great sculptures from their panels in the temple, but who did not think it worth while to pick up and bring away a section of the cornice which covered them, and which lies all about the platform on which the so-ruined temple stands!

It is to be always borne in mind, too, that in all the great styles of architecture, there is not alone the most expressive and emblematical of it to be studied, and, if nought better can be done in these days, *imitated* and copied, but there are always the *beginnings* of such style, and the *endings* or decline of it. And to a thorough comprehension of it these are as necessary as the study of the fully and more perfectly developed phase of the style in its maturity and perfection. There is really no exception to this rule; it is universal all the world over, and through all time. In the Gothic we may read its history from birth to death in our great cathedrals,—nay, for that matter, in almost any one of them; and in the museum as it is, and imperfect as it is, no slight idea is given of the beginnings, perfection, and endings of the *Greek*. A subject this all but new, and certainly waiting to be thoroughly analysed and studied; and it is for this purpose that a large and as complete a collection as possible is needed.

Who will begin it?

OUR EXPORTS AND IMPORTS.

THE variation in value between the goods we import and those we export is continuing to provoke a good deal of discussion; and there is no doubt that some of the features of that variation need attentive consideration, the more especially as its extent has been for some time growing. A few figures will show in a novel mode the variation. In 1861, the imports of goods into the kingdom amounted for that year to 7*l.* 10s. 2d. per head on the population of the United Kingdom, and the value rose gradually and rather irregularly to 11*l.* 11s. 2d. per head in 1873, and in 1876,—the latest year for which the proportion is officially given, — it was 11*l.* 6s. 8d., or some 4s. 6d. per head below the maximum value. But the value of the exports of British produce rose from 4*l.* 6s. 5d. per head on the population of the United Kingdom in 1861 to 8*l.* 1s. per head in 1872; but since then it fell to 6*l.* 1s. 3d.,—a much more serious declension; and thus what is known as the balance of trade is apparently very greatly against us. We have, however, after thus roughly indicating the extent of the variation, to ascertain the totals before we can grasp the real bearing of the change, and before we can come at the special feature which has not in the discussion been as yet sufficiently touched.

First, as to our imports. In 1862, the total value of goods we imported was 225,716,976*l.*; and the value rose with comparative regularity until it reached, in 1877, the sum of 393,941,256*l.*, —a very rapid rate of increase. But it is especially noticeable that certain kinds of imports have increased in far more than the general rates: thus, the butter imports are doubled, cheese is trebled, eggs are fourfold in value, wrought or manufactured iron and steel goods are sevenfold, and refined sugar is eight times what it was seventeen years ago. Whilst there has been this large increase in the general imports, let us see how it has fared with the exports. First, as to exports of British and Irish produce:—In 1862, the value of this produce exported was 123,992,264*l.*, and by the end of 1872 it had risen to 256,257,347*l.*; but it has since fallen, until last year the amount was 198.731,073*l.*, so that it is at once evident that the increase in the value of the exports is not so great in the sixteen years as is that of the increase in the value of the imports. In regard to the colonial and foreign merchandise exported, it may be said that, in 1861, it was 42,175,870*l.* in value, and it rose and fell, reaching the highest value in 1871, when the amount was 60,508,538*l.*, and falling off some 3,000,000*l.* since that year. Returning to the British and Irish goods exported, it may be said that the details prove that the beer and ale exports have the average increase, as have also the larger items of cotton manufactures, steam-engines, and iron and steel goods as a whole, silk manufactures, and woollen and worsted manufactures. Our coal exports, machinery (other than steam-engines), cotton-yarn, jute manufactures, and one or two other classes of goods have increased in much more than the general proportion; but the linen manufactures, as a whole, have been stationary, and in some of our lesser manufactures there is a decrease in the exports. Although we imported goods to the value of 393,941,256*l.* last year, and our exports of British and Irish goods were only 256,257,347*l.*, it does not follow that the whole of the balance is against us. Adding to the latter sum the value of the foreign and colonial goods exported, we have still a difference of about 80,000,000*l.* against us; that is to say, we import goods to the value of 80,000,000*l.* more than we export. But it does not follow that we pay the balance in money. There is a difference in the value declarable of exports and imports which reduces the balance in some degree; for, on the one hand, the freight is added to the cost of the goods, on the other it is not, and as the bulk of the trade is in British hands, those freightage charges are chiefly paid to our shipowners, and the amount, and that for services in a similar method rendered abroad, with the interest on occasional loans to foreign States, paid in kind, must very seriously reduce the balance. But the fact remains that that balance has increased during the last few years, and it is this fact which is the most striking, and which has suggested the jeremiads that we are now beginning to live upon our capital.

There is another fact which is most suggestive, and it is that of some of the manufactured goods our imports are increasing whilst our exports are decreasing. In the last three years the value of our writing and printing paper exports has declined, whilst the value of the imports of that class has increased. Similarly our exports of iron and steel have fallen off in value, whilst our much smaller imports have increased in the same period. The same statement holds good in relation to glass, to cotton manufactures, and to one or two other kinds of goods; and though the extent and significance of these facts may be over-estimated, they may also be under-estimated. It is evident that we have now to meet with a growing competition in manufactures, and that this will in some considerable degree alter the conditions of our export and import trades in the future. We are often beaten on our own ground by some neighbouring nations in the cheap production of certain classes of iron goods; in glass some nations deliver their productions here cheaper than our makers can make them; and there is apparently setting in a considerable demand for some kinds of American hardware and ironmongery goods in preference to our home manufactures. It is true that in the present year there has been a step in the right direction to meet this growing competition by a tolerably-general reduction of the cost of production, whilst some attempts are in progress to improve the product. Concurrently with these it is satisfactory to notice that the value of our exports is beginning to show signs of an increase, and that the value of the imports does not increase in like ratio. On the contrary, it is more than possible that the imports will decrease in value, for we have been paying very largely increased sums for wheat and bread stuffs, in consequence of deficient harvests and of the war panic. Whatever may be the ultimate upshot of the political uncertainty, it seems probable that there will be a more abundant harvest, and to the extent to which this is the case we may find a falling off in the value of the imports, and the balance will be lessened against us by the double process alluded to. But it cannot be too often remembered that we need to meet a growing competition, and that the efforts of both employers and employed will be needed to enable us to meet it as successfully now as in the past. The cost of production must be further reduced wherever possible, and the processes must be so amended as to improve the product, if Britain is to continue to be as much of a producing nation as now, instead of one which would be something more like a warehouse.

WATERWORKS FOR SMALL TOWNS.

WINSFORD.

ABOUT three years ago the attention of the Local Board of Winsford was drawn to the then existing water supply of their district, which was both defective in quality and deficient in quantity, and a scheme was proposed to take the water from some springs at the source of Shaw's-lane Brook. This scheme was approved of by the Local Government Board, and the works are now completed.

The springs are about three-quarters of a mile from Oak Mere, in Delamere Forest, and at about 30 ft. lower level. From their steady yield all the year round, and from the fact that the Mere has no outfall, there can be little doubt but that the water percolates through the ground and comes from this source. The land between the Mere and the springs is composed principally of sand, and therefore forms a natural filter. The water is, as Dr. Frankland reported to the Local Government Board, clear, palatable, and wholesome, of most excellent quality for dietetic and domestic use, soft, and therefore well adapted for washing purposes.

The water is conveyed from the uppermost springs, locally known as Stretche's Springs, in a 12 in. earthenware pipe for a distance of 453 yards to the straining frame wells. Near the wells is another spring, known as Austin's Spring, which is at a lower level than Stretche's Springs by 10 ft. An embankment is formed across the valley, forming a small reservoir above; and by a self-acting arrangement this water can be utilised when required. At the present time, however, the uppermost springs are found to yield sufficient for the domestic requirements of the district. The water after passing through the strainers is conveyed into a reservoir, and, by an arrangement of pipes and valves, can be passed round the reservoir into a circular well, and thence to the town. An iron pipe, 10 in. diameter, conveys the water for a distance of three miles and a half to the town.

During the construction of the works great difficulty was experienced with springs, and it was found necessary to puddle the whole of the bottom of the reservoir.

The greater portion of the district is supplied by gravitation; but for the higher section along Over the water has to be lifted 60 ft. by steam power into a wrought-iron tank built on the top of a tower.

The length of the main is 14½ miles, and the total cost of the works has been about 17,000*l.*

The contractors for the several works were,—Mr. C. E. Firmstone for the iron pipes; Mr. George Oakes for unloading the same; the Glenfield Company, Limited, Kilmarnock, for the valves and hydrants; Messrs. John Pickthall & Sons, of Barrow-in-Furness, for the construction of reservoirs and laying mains; Messrs. Ashworth, Brothers, of Manchester, for engine, boiler, and tank; Mr. John Price, of Winsford, for building tower, engine-house, chimney, mechanics' shop, and service reservoir; Mr. Alfred Webb, of Belfast, for iron fencing; and Mr. John Lightfoot, jun., of Winsford, for fixing the same.

The works were designed and carried out by Mr. Henry Bancroft, civil engineer, of Manchester.

TECHNICAL EDUCATION AND THE CITY GUILDS.

AT the meeting of the Court of Common Council on the 16th inst., a letter was read from Mr. John Watney, Mr. W. Phillips Sawyer, and Mr. Owen Roberts the joint honorary secretaries of a committee of livery companies, enclosing copy of a lengthy report on the best mode of applying the funds which the Corporation and the companies might be willing to contribute towards the extension and improvement of technical education, and stating that the committee trust the Court will give its adhesion to the report, and nominate representatives on the Board of Governors. The committee stated that they had consulted a number of men of high standing and varied pursuits as to their views on technical education, and had received reports from Sir W. G. Armstrong, Mr. G. T. C. Bartley, Lieut.-Colonel Donnelly, Capt. Douglas Galton, Professor Huxley, and Mr. H. Trueman Wood. The committee recommended generally that they should not "teach the workman to be more expert in his handicraft, as in their judgment this form of improvement is one which must be derived from greater assiduity in the workshop" . . . . "but they advise that the direction to be pursued in improving technical education should be one which will give to those employed in manufactures the knowledge of the scientific or artistic principles upon which the particular manufacture may depend." In the judgment of the executive committee, the desired ends can best be attained by means of a central institution, and by means of local trade schools. They recommend the establishment, in some convenient locality, of a central institution for more advanced instruction, to supply competent teachers for the local trade schools. It was believed that it would be well to trust to residents in the localities where these schools are most needed to establish them, as the committee thought the object of the companies might best be attained by affording aid to such local effort; but should the assistance thus given not form a sufficient inducement to secure the establishment of suitable trade schools, the executive committee would recommend that the establishment of at least two such schools, to serve as models for others, should be undertaken by the companies. Temporary buildings might be secured for the purposes of the scheme until it was ascertained how it progressed. The committee were advised that the course of studies at the central institution should embrace applied physics, applied chemistry, applied mechanics, and an applied art department. Provision was made for a representative government of the institution by those contributing to its expense. The committee trusted that the livery companies would contribute a sum of not less than 20,000*l.* per annum. Conditionally, several companies had promised sums amounting in the aggregate to 11,580*l.*, and other companies had promised assistance, without yet defining the amount.

It was resolved that the letter and the scheme should be printed, and a copy sent to every member of the Court.

CONGRESS ON NATIONAL WATER SUPPLY.

SOCIETY OF ARTS.

A CONGRESS to discuss the question of a comprehensive scheme of national water supply, "with a view to the consideration of how far the great natural resources of the kingdom might, by a large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account, for the benefit, not merely of a few centres of population, but for the advantage of the general body of the nation at large," as suggested in the letter * of H.R.H. the Prince of Wales, president of the Society of Arts, was held in the hall of the Society, Adelphi, on Tuesday and Wednesday.

Tuesday's proceedings were devoted to papers and discussions on (1) the great natural water resources of the kingdom; and (2) how they can best be utilised and economised for the supply of large towns, small towns, and country places; while Wednesday's proceedings were principally devoted to the supply of water to London.

Sir Henry Cole, who occupied the chair in the unavoidable absence of the appointed chairman, Sir Ughtred Kay-Shuttleworth, M.P., in opening the proceedings said the suggestion contained in the letter of the Prince of Wales was of great national importance; in fact, it was hardly possible to overrate it. The people of the country were as much entitled to pure water as to pure air, and this, no doubt, could be obtained if the Government were to appoint an authority for obtaining a supply for the whole of the country. He would not go into detail, but no doubt engineers would be able to devise a scheme for dividing the country into districts, whereby the object would be attained, and even if 100 or 200 millions were expended, it could be obtained at a moderate interest with a Government guarantee, and they would not only be repaid commercially, but more than repaid economically in the improved health of the country.

Mr. G. J. Symons submitted a paper which he thus epitomised:—

1. The quantity of rain falling cannot be increased.
2. The population is doubling about every twenty-five years
3. The larger the population the more water will be fouled.
4. There will, therefore, be less clean water in future years, and yet there will be two, three, or four times the population even within a century.
5. Entirely new arrangements will, therefore, be necessary.
6. It would have been much better if the entire administration of streams was under a single direction, which should see to all questions of drainage, sewerage, canalisation, motive power, and water supply.
7. Such new works as are required promptly should only be authorised subject to their reverting to Government in fifty or a hundred years.
8. All other hydraulic works should be undertaken, or at all events supervised, by a Government department, so as to insure the greatest possible public benefit, and not merely that of an individual town.
9. These objects will be best obtained, and a very large national saving will be effected, by gradually organising an hydraulic department, resembling as much as possible that of the Ponts et Chaussées, with a training school attached fitted with laboratories, &c., like that at Paris. There is no reason why such a department should not confer upon England advantages equal to those which the similar office has conferred upon France. Are we too proud to learn from our neighbours?

"What the difficulty is, what has been done to meet it, and what remains to be done," were the topics dealt with in a paper by Mr. Joseph Lucas, F.G.S. On the last head of his subject he said:—

"In my humble judgment, a supplementary measure, providing for the formation of a national survey of the sources of water-supply, would act as a motive-power to set existing machinery in motion, and thus facilitate the acquisition of water under the provisions of the Acts of Parliament that already exist.

The sources of water-supply are of two kinds, viz., surface and subterranean, which correspond broadly with impervious and permeable strata. Except in the case of tank-storage, all water-supply is derived directly from one or the other, in view of which consideration I was led some years ago to apply the name of 'hydrogeology' to this now accredited branch of scientific inquiry.

Hydrogeology takes up the history of rain-water from the time that it touches the soil, and follows it through the various rocks which it subsequently percolates.

A hydrogeological survey investigates all the conditions under which it exists in its passage, both above and below ground, from the rainfall to the sea.

In respect of surface basins, or impervious surfaces, the tributary valleys, whose united contributions go to form the large floods in the main valleys, contain natural sites for reservoirs, naturally boggy, sometimes drained, but occasionally converted into large ponds. A series of dams constructed on these sites, on a comprehensive system, and with regard to all the interests involved, would form good retarding mediums for the downward flow of flood-waters, and also afford provision for the requirements of upland rural districts during periods of drought.

In view of these considerations, it forms part of a hydrogeological survey to map all these sites, the utilisation of which as store reservoirs for water-supply would prove a great national advantage.

Many years' experience in the field has convinced me that the multiplication of moderate-sized dams, on sites such as those indicated, which are fairly plentifully distributed, would provide an abundant supply of water, mainly or wholly spring water, to large districts now distressed for want of the same. For these reasons I hold that it is part of the scheme of the survey to provide information as to the geological suitability of reservoir sites, viewed broadly.

Again, while the flood-waters are being shed from impervious surfaces, their equivalent is filtered down into the subterranean reservoirs contained in the permeable strata.

Thus is generated a series of water systems, on which probably two-thirds of the area of England are dependent for their water-supply. For this reason, as long ago as the year 1872, it appeared to me a matter of paramount importance that the form and position of these subterranean accumulations of water should be known. I therefore undertook, as opportunity offered, during the years 1873, 1874, and 1875, a series of observations on the chalk water system. Since January, 1876, I have devoted my whole time to the conduct of my survey, and have surveyed about 800 square miles in the Thames basin and the major portion of the county of Hampshire. . . . .

I am of opinion, therefore, that a national survey of the water-bearing strata is the measure that would best serve the present requirements of the country in general. It is an essential forerunner to the execution of any scheme of a constructive or legislative kind, and even, in my opinion, to the successful framing of such. Government would best minister to this popular want by investigating and providing the necessary data, alike to the landowner, the ratepayer, and the engineer, which no interested party can be expected to undertake on a comprehensive scale.

I give it as the result of my experience that the publication of the maps and tables of observations made by the survey would provide fresh food for engineering science, act as a stimulus to engineering enterprise, and promote engineering work. This step would leave the hands of the Government free to adopt in the future any legislative measure that might arise out of the survey, while the engineer would also be left free and untrammelled, as now, save that instead of fragmentary evidence to work upon, he would have a uniform and comprehensive survey, and a map in which the hydrogeology of wide tracts of country are brought well under the eye."

The Rev. J. C. Clutterbuck, in his paper, remarked that,—

"The mere fact of the existence of the difficulties surrounding the question seems to point to the necessity of a more extended and practical knowledge of the whole subject of the water economy of the country. The ordinary officers of the Health Acts have little, if any, scientific knowledge of the question. Most ruinous failures, especially in boring for water without sufficient geological or hydrogeological knowledge even of the most elementary character, show that the present condition of the science,—for science it really is,—will not warrant any attempt at a large and comprehensive scheme, as suggested by the letter of the Prince of Wales. The extent of water-supply, which be it remembered, has its limits, and varies with times and seasons, must be more accurately ascertained. The rainfall by Mr. Symons and some others even yet requires further investigation and practical knowledge. There is a great and growing disposition, especially in and about the neighbourhood of London, to tamper with subterranean water, involving the danger of decreasing the volume of that which, under natural circumstances, flows in a more or less perennial form above ground, and ultimately diminishing the subterranean supply. Moreover, the present laws by which the interests of subterranean water are ruled cannot be deemed satisfactory, or likely to lead to economy, which year by year is of greater importance. It is manifestly difficult to suggest any scheme by which increased and trustworthy knowledge of the great water question can be secured; that there is much to learn is manifest. The neighbourhood of London and its chalk basin have of late found a most industrious investigator in Mr. Joseph Lucas. Encouragement should, at any rate, be given to all such attempts at hydrogeological study, and it may be, as facts and information on this all-important subject are obtained and recorded, the great and good object of the Prince of Wales's letter may find its fulfilment and reward."

Mr. F. R. Conder, C.E., followed with a paper, of which we give the practical conclusion:—

"The problem now before us is that of the collection and distribution, in a pure condition, of less than one per cent. of the rainfall of England.

This is not a problem of great inherent difficulty, if the proper course be taken for its solution. The first indispensable step is the collection of the hydrological data. There is not a single river in our island as to which we are in a position accurately to strike the balance between the rainfall over its basin, and the escape of the amount by evaporation, by sub-aërial, and by subterranean discharge. Any works attempted in ignorance of the hydrography of the district in which they occur, tend to complicate the general problem. It is impossible to separate the question of water-supply from that of drainage, for this reason. Every ton of water brought into a town or house has to be removed when its work is done. Thus water-supply and drainage are as closely related as are concave and convex. Not only are the constructors of works carried on in partial or total ignorance of the general hydrography of a district likely to neglect natural resources, but they may inflict irreparable injury on other districts.

Thus we see, at the moment when the wants of the rural districts are so great as to have attracted the attention of H.R.H. the Prince of Wales, schemes of alarming magnitude proposed in entire ignorance of the main controlling facts. It has been proposed to decant into the valley of the Thames the head waters of the Colne, the Wye, the Severn, the Dove, and the Eden. The natural sources of supply that exist on the right bank of the Thames are, in the mean time, left without investigation. The grave consequences of the wholesale contamination of the Thames by the Metropolitan Board of Works are beginning to excite anxiety (as anticipated by the present writer in 1873). At Carnarvon, Hastings, Margate, Brighton, Glasgow, and other places, the construction of what are called sanitary works are creating intolerable nuisances, perilous to human life. The unregulated action of a host of incompetent local authorities is rapidly tending to render parts of the country uninhabitable, and to convert an engineering question originally simple, into one of invincible difficulty. Such is the natural result of the commencement of numerous hydraulic works without the previous completion of a hydrographic survey.

In what manner existing information can be most readily collected, existing machinery made most available, and the great national need for information most promptly supplied, in accordance with our usual mode of conducting business, I am prepared to indicate if desired. The subject is one as to which we can ill afford to make any more mistakes."

Dr. Gilbert W. Child, of Oxford, contributed a paper, in which he said that:—

"In any scheme whatsoever for the purpose of supplying the population of the country with water—if it is ever to get beyond the region of mere theory—the first principle must be that the supply shall be provided *at the lowest possible money cost* consistent with securing sufficient quantity and adequate purity. This principle at once excludes the idea, which the phrase 'a large and comprehensive scheme' appears to some persons to suggest—of the selection of some one vast source of supply, and its distribution by means of a gigantic system of mechanical arrangements over the whole country. It is simply inconceivable that villages situated, *e.g.*, on the lias or oolite formations, abounding in streams and springs of wholesome water; others on the dead flat of the Oxford clay, whence no water can be extracted fit for use, and where only an occasional stream rising in some more favoured district flows slowly across the surface, and others again high upon the chalk of the Chiltern Hills, where you may go for miles together without seeing a stream, and may bore 400 ft. before you come to water,—can all be *economically* supplied by the same means, or from the same source.

I conclude, therefore, that the phrase in question is intended to apply, not so much to the mechanical means by which a water-supply is to be obtained, as to the legislative and administrative machinery whereby we may insure that the population,—more particularly that portion of it which inhabits the small towns and rural districts,—shall all be supplied with wholesome and drinkable water, by whatsoever means may be shown to be most practicable in each separate district. . . . .

The elementary principles upon which any great general improvement in the water supply of this country can be inaugurated are two, viz.:—

(1.) A moderate re-organisation of the machinery of local government; and

(2.) In the carrying out of the actual work required, due regard, before all other considerations, to the physical conformation, and the geological characters of each district which has to be supplied."

Mr. W. Shelford, in his paper, remarked that:

"Want of good water is widespread. It is greatest in the smaller towns, villages, and country districts, where the cost of works for a systematic supply would be too great a burden, even if the population were disposed to construct them for the utilisation of the nearest local source.

The alternative which naturally suggests itself to the mind of an engineer, viz., the creation of one or more great national sources of supply in mountainous and lake districts, supplemented by pumping from the chalk, sandstone, and suitable strata, and distributed through the country by arterial aqueducts, with ramifications by pipes into every village, may be dismissed for the following reasons:—1st. On account of the cost. 2nd. Because of the difficulty of constructing the works to suit the ever 'varying specialities and wants of districts.' 3rd. Because it has not yet been shown to be either necessary or practicable; and, 4th. By reason of the great difficulty of reconciling such a scheme with the negative policy of the British Government, even if the combination of the various towns having existing works, and the apportionment of the taxation, did not prove to be insuperable.

From a constructive point of view, the aim should be simplicity rather than grandeur. The works should vary according to the locality, its physical resources and conditions, its means and wants, and should be regulated by and subordinate to a well-organised administration.

In so far as the water supply of the country is dependent upon streams and rivers (and they are naturally its principal sources), its present want results from the abuse of the streams; but the interests which they serve in the carriage of refuse are too great to admit of the possibility of their complete purification.

Hence the problem for the engineer to solve is, how to supply the poorer and more scattered populations, whilst not diminishing the carrying capacity of the streams; or, in other words, how to provide good water without interference with the foul water.

The key to this problem consists in the separation and collection of sufficient good water at its source, and its conveyance by separate channels or conduits along the valleys, so as to restore to the populations one of their most important amenities."

Mr. C. E. De Rance, of H. M. Geological Survey, submitted a paper accompanied by a table in which were embodied approximate calculations of the area occupied by the different geological formations in each group of river basins, the extent and areas of which he had taken from the Catchment Basin map published by the Ordnance Survey. From this table it appears that,—

"An area of nearly 12,000 square miles in England and Wales is occupied by the more ancient palæozoic rocks, receiving the heaviest rainfall experienced by this country, ranging from 40 in. to more than 75 in., and even up to 130 in. per annum, which is yielded in springs and streams, which the analyses of the Rivers Pollution Commissioners show, have a remarkable freedom from organic impurity, and in a condition of great softness.

The large bodies of water that annually run off the mountains of the lake district and central Wales belong to this class, and, as far as human consumption is concerned, on a large scale, are wholly lost and wasted. From the exceedingly impermeable nature of the ground, and its steep declivity, the rainfall flows off at once as floods; the dry weather flow of streams of such districts, according to Mr. Bateman, amounting only to one-fourth to three-fourths of a foot per second from each 1,000 acres drained, against 200 to 500 cubic feet per second in time of flood.

The 10,000 square miles of carboniferous rocks, though supplying large volumes from the *Goredale* and *Millstone* Grits, to the reservoirs supplying Manchester, Liverpool, Bolton, Preston, Blackburn, and numerous towns in York-

* Mentioned in the *Builder*, p. 196, *ante*, and commented upon, pp. 203-204.

shire, have still a large residue available for use in gravitation schemes.

Over a large portion of the 8,000 to 9,000 square miles, occupied by the *Permian* and *Trias*, not less than 10 in. of rainfall are annually absorbed, capable of yielding a volume of 400,000 gallons a day. These important water-bearing formations, though penetrated by a large number of wells, some yielding two to three millions of gallons per day, have still immense water-bearing resources, in a district of which a large portion is densely populated.

The *Oolites* absorb a large quantity of water, which they yield up in springs of great importance and value, especially if the large quantity of water they give off after heavy rainfalls were stored, as the water now given off is of great purity, but is almost always polluted in streams before it is made available for consumption.

The *Greensands* and the *Bagshot Sands* are in some districts of local importance, and might be included in any general scheme that divided the country up into districts for the purpose of collecting springs or sinking wells for water-supply.

The vast area of the *Chalk* receives over a part of its exposure probably not less than 5 in. of rainfall annually percolating into its mass; but in some portions of its area, in the eastern counties, it is so overlaid by boulder-clay of an impermeable nature, and in the southern counties by clay, with flints, that probably the percolation is much smaller. The dry-weather flow of its streams being dependent on this percolated water, it would probably not be safe to count on more than 2 in. of rainfall per square mile per year, or 80,000 gallons per day, as capable of being yielded in wells, without interfering with the drainage of the country, but a large number of springs might, with great advantage, be utilised, that are now running to waste, which remark applies generally to the springs that are lost in all parts of the country in various geological formations. Many of them occur in railway cuttings and tunnels, where they might easily be collected, and carried by means of pipes along the line to various country stations that the railways pass through. A suggestion of this nature has already been made, I believe, by Mr. Mott, of the Great Western Railway, to his brother directors.

No one scheme or method of water-supply can be recommended for the country; for even in one water-basin a gravitation scheme may be best for one portion of the area, and a pumping scheme from wells in another.

Each district requiring special and personal study, it is to be hoped that the Local Government Board may become a department of public health, with a staff of officers ready to give each district individual attention, and rescue them from the ills they now experience."

Dr. John Evans, F.R.S., presented a paper, in which he discussed the relation of the water-supply of any given locality with the geological features of the district, and then proceeded to refer to the following questions, viz.:— (1) The right which centres of population, whether large or small, have to acquire the water necessary for their use, when by so doing the interests of others are affected; and (2) the equitable method of meeting the cost of obtaining the supply. He remarked that,—

"With regard to the first question, it would appear that the principle should be maintained that each town should draw its supply within the watershed on which it is situated, and, only under most exceptional circumstances, be allowed to go beyond it. As to interference with existing rights, the law is fairly clear in the case of streams running above ground; but with regard to underground waters, and streams running through districts, the subsoil of which is readily permeable, the law, as at present interpreted, operates in the most inequitable manner. Although, if water be pumped directly from a stream, those interested in it are entitled to compensation; yet, if the whole stream were indirectly pumped dry by means of wells placed along its banks, so as to convert the porous bed of the stream into a mere filter, no action would lie for the damage. A legal recognition of rights existing in underground waters, where they follow natural laws as well ascertained as if they flowed above ground, ought certainly to be accorded if law and reason are to go hand in hand, and would turn away some of the opposition now raised to schemes for utilising such waters.

With regard to the incidence of the cost of waterworks, it will usually be found that, in the larger towns, the supply of water will be sufficiently remunerative for it to be undertaken by private enterprise, or by the local authorities, or, at all events, without having recourse to what must be regarded as a charitable rate. But, in the smaller towns, and in country parishes, the conditions are often totally different. The position of nearly all our small towns and villages has been determined by the existence, upon the spot, of a more or less abundant supply of water. In many instances, this is derived from shallow wells, which, owing to the neglect of proper drainage and sanitary precautions, have become dangerously polluted. In such cases, where it is quality rather than quantity which is defective, it is, perhaps, drainage rather than water-supply which ought to be studied. In other cases, where from local causes the population has increased beyond the water-supply, new sources will have to be sought; and here the question as to who should bear the cost requires careful consideration. If those who built houses in situations where no proper water-supply existed were made responsible for obtaining the necessary water, no one could in fairness object; but the system at present pursued of calling upon a district or even a whole parish to be rated for the supply of water to a new colony of houses erected by some building speculator is manifestly unjust. No wonder that those who live, it may be, miles away, though in the same parish, and those against whose will the new houses have been erected, without which the old water-supply would have sufficed, object to such claims upon their purse."

Mr. Walter Pierce, president of the Liverpool Land and House-owners' Association, in his paper dealt with the pollution of well and river water by sewage and other impurities, and said that,—

"The system of town and other districts having the control and direction of the water-supply has been useful in the past. But the circumstances have so altered, by reason of greatly increased populations, fewer districts to select water from, and very much greater scientific knowledge on sanitary science being now abroad, it is almost a foregone conclusion that the water-supply should be undertaken by the Government for the nation."

He quoted from the Report of the Royal Commission on Water Supply in support of this view.

Lieut.-Col. A. H. Brown, M.P., in a long paper, discussed the question of the state of the water supply to rural districts and small towns, and explained the steps he had taken in his Public Health Act Amendment Bill (which has just passed its third reading in the House of Commons), with the view of remedying some of the evils which exist.

"The Bill proposes that the Sanitary Authority shall take action only on the report of the inspector of nuisances or medical officer of health. The object of this provision is that thereby the responsibility is thrown on those officials who are appointed to watch this important matter; and in another part of the Bill power is given to make such inspection as is necessary to carry out the object.

Where a Sanitary Authority are of opinion that a water-supply ought to be provided, they may give the requisite notices calling upon the owner or occupier to provide a supply for the house, provided (and this is a most important provision) that the cost of providing the supply is not more than a capital sum, the interest of which at 5 per cent. would not exceed 2d. per week. The capital sum would be 8*l.* 13s. 4d. But where a water-supply is difficult to obtain, and where such a sum would be too small, the power is given to the Local Authority to charge more, provided that the Local Government Board consider it reasonable to do so.

It may be said that the sum above mentioned, 8*l.* 13s. 4d., is very small for providing a water-supply for a house, but it must be remembered that if two houses are to be supplied, the amount will be double that sum, and if three houses, then three times that sum; and provision is made in the Bill that a common supply can be made for two or more houses, which I hope will take place in many cases. The evidence shows that the limit of cost in most cases would be sufficient.

The means by which water is to be supplied is not set forth in the Bill, but is left to be settled by the circumstances of each particular case."

A paper sent by Mr. R. Jackson, clerk to the Chorley Improvement Commissioners, was next noticed. The Commissioners, at a recent meeting, unanimously passed the following resolution:—

"That the Clerk be requested to write two letters, one to Mr. P. Le Neve Foster, and one to the Right Hon. Lyon Playfair, showing how the present and future supply of water for Chorley admirably illustrates the far-seeing sagacity of the Prince of Wales's letter to the Society of Arts. That whilst Chorley is well situated for manufactures, it has no right to a supply of water from the Liverpool Corporation, except for house-supply. That, as a matter of fact, the Liverpool Corporation does supply, to a certain extent, the water required by some of the manufacturers, but it has reached its limit in that respect, and refused to supply 50,000 gallons per day applied for by a manufacturer. That Liverpool draws a large supply from this neighbourhood, and that the Thirlmere water in its passage to Manchester will pass through or near Chorley, and that the Chorley Commissioners consider it would be only just and reasonable that Chorley should be entitled to claim a *pro rata* supply of water by paying their fair share of the expenses of collecting and supplying the water. If some such arrangement cannot be made, towns such as Chorley must stand still while the large towns grow at their expense."

"In connexion with the foregoing [says Mr. Jackson] I may state that Chorley lies in the neighbourhood of coalfields, within twenty miles of Manchester, having railway communication with that town and Liverpool, yet it has not progressed as might have been expected, as will be shown by the following figures:—In 1831, the population was 9,282; in 1841, 13,139; in 1851, 12,684; in 1861, 15,013; and in 1871, 16,864.

In 1846 an Act was obtained for better supplying with water the town of Chorley by a company, which was bound to provide and keep constantly laid on a supply of pure, wholesome water, sufficient for the domestic use of all the inhabitants of Chorley entitled thereto as therein mentioned, and to provide water for extinguishing fires. A domestic supply did not include water for closets, baths, horses, cattle, carriages, or any trade or business, but the company was empowered to supply water for other than domestic purposes by agreement.

In 1856 the undertaking of the Chorley Waterworks Company became vested in the Corporation of Liverpool, which was bound by Parliamentary enactment, at all times thereafter to afford as ample a supply of water within the Chorley district as the company would have been bound to afford, and to supply water for baths and water-closets at certain rates therein mentioned; also to supply the Chorley Commissioners with a water-supply for flushing sewers, watering streets, and other sanitary purposes.

For trading purposes, other than domestic or sanitary, the inhabitants of Chorley, and the neighbourhood have no security for a water-supply from the Chorley Waterworks, although, from the contiguity of hills, nature has provided such supply."

Mr. George Frederic Wills, of Crewkerne, in a short paper, said,—

"The chief obstacle in the way of obtaining proper water supply is, I believe, the constitution of the local authority. This, in rural districts, is largely, sometimes almost entirely, composed of farmers, who are the chief ratepayers, and whose object naturally is to keep the expenditure at a minimum, as their own pockets suffer most from local rates; and although in sanitary measures land is taxed less heavily than houses, yet it is certain that farmers' houses, and their labourers' cottages, scattered as they are in the country, derive (directly) little, if any, benefit from money expended in sewerage or water supply. They are, therefore, extremely averse to such expenditure, especially as most of them hold their lands on lease, or even yearly agreements, and are, therefore, unlikely to reap advantage from the later and indirect benefits which such sewerage or water supply will probably confer on the district. . . . .

Then as to villages and small hamlets. In many districts the sanitary acts are a dead letter. The sewage still follows its old course, permeating the soil, contaminating wells, and not being carried away by any drain or sewer. Out of sixty villages within a few miles of this town I do not know one which properly carries away its sewage. What wonder, then, if fever, diarrhœa, consumption, and other preventible diseases still continue to demand the yearly victims? The sanitary authorities do not interfere, from the reasons I have given; the Local Government Board make no inquiry and receive no information; and the public rest contented so long as none of their own families fall victims. If the Local Government Board would only make it compulsory on sanitary authorities to print and circulate the reports of their medical officers, a wonderful change would be effected by the information such reports would give."

Wednesday's sitting of the Conference was, as already stated, chiefly devoted to the discussion of the question as affecting London; but the following general resolution was moved by Dr. Wright, Medical Officer of Health for Cheltenham, seconded by Mr. F. R. Conder, C.E., and unanimously agreed to, viz.:—

"That this Congress desires to urge upon her Majesty's Government the importance of taking steps, with the least possible delay, to appoint a small permanent Commission, to investigate and collect, for the information of the public, the facts connected with water supply in the various districts throughout the United Kingdom, in order to facilitate the utilisation of the national sources of water supply, for the benefit of the country as a whole, as suggested by his Royal Highness the Prince of Wales, the President of the Society of Arts, and recommends that the Council of the Society of Arts be requested to ask the Earl of Beaconsfield to receive a deputation to present the resolution and advocate its adoption."

We shall continue our report next week.

OAK OR CHESTNUT?

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday evening last, Mr. Charles Barry, F.S.A., president, in the chair,

Mr. W. H. White, secretary, formally announced the decease of Mr. Henry Baker, Fellow. This event was mentioned in the *Builder* for May 4th (p. 451, *ante*).

The recommendations for membership included the names of Mr. W. Calder Marshall, R.A., and Sir Richard Wallace, who seek to become Honorary Associates.

The following gentlemen were balloted for and duly elected, viz.:—As Fellows: Mr. Robert A. Bryden, Glasgow, and Mr. Cornelius Sherlock, Liverpool. As Associates: Mr. Josiah Conder, of the Imperial College of Engineering, Tokio, Japan; Mr. Neil Macara, Darlington; Mr. R. C. Page, of Buckingham-street, Strand; Mr. William Paice, of Henrietta-street, W.C.; and Mr. Sydney Turner, of Mark-lane. As Honorary Associates: Sir Edmund Beckett, Q.C., and Sir James Ramsden, C.E.

The President read a letter which he had received from H.R.H. the Prince of Wales, asking him to act as honorary juror in Class IV., Architectural Drawings and Models, in the Paris Exhibition. As he regarded this as a complimentary recognition of the Institute, he had accepted the position.

Professor Donaldson moved, and Professor T. Hayter Lewis seconded, a vote of thanks to the President for accepting the position.

Several donations to the library were announced, including a new work by Mr. John Pennethorne (brother of the late Sir James Pennethorne) on Greek architecture.

Professor Donaldson spoke of the profoundness of the work, to which the author had devoted a great many years of thought and labour. He moved a special vote of thanks to him for kindly presenting a copy of his valuable work to the Institute.

Mr. Penrose, in seconding the motion, said he had not yet had time to give more than a cursory glance at the work, but he was satisfied that Mr. Pennethorne was the discoverer of the horizontal curves of the Parthenon and other temples of Athens, and therefore anything he had to say was likely to be of great importance and authority. In fact, in the investigations he (Mr. Penrose) had to make, he had to follow Mr. Pennethorne's steps.

The motion having been carried,

The President requested those members who were desirous of being present at the Institute dinner on the 4th prox. to make application for tickets before the 31st of May. It was hoped that on that occasion there would be an unusually large gathering of Fellows, Associates, and Honorary Associates.

Professor Donaldson called attention to the Premises Improvement Fund, and said it was desirable that those who had not yet subscribed should do so at once. As a considerable sum was still required, owing to the necessary works being more extensive than was at first anticipated, he, as a subscriber of ten guineas, would be happy to double his subscription if each subscriber of a like sum would do the same.

Mr. H. H. Statham asked whether the scheme of alterations had been decided upon.

The President replied in the negative, and said that after the close of the Conference, it was intended to call an early special meeting to discuss the subject.

Before the discussion on his paper* commenced, Mr. Blashill said he had brought forward the question on practical and not on archæological grounds. He had mentioned in his paper that a painter's palette of what he said was oak was exhibited in the museum in Kew Gardens as being of Spanish chestnut, from an old beam in Windsor Castle. He had the pleasure of saying that he had induced Mr. Jackson, the curator of the museum, to bring the palette with him to the meeting, and no doubt he would say a few words on the subject.

Mr. Thomas Morris quoted from Tredgold and Loudon with the view of distinguishing between the varieties of English oak. There were two leading varieties, and two only, viz., *Quercus robur*, and *Quercus sessiliflora*. The first had its flowers and fruit at the end of foot-stalks, and had a fine silver grain, well shown in radial section, but lost in tangential cuttings. In the *sessiliflora* the flowers and fruit were, on the contrary, seated close to the wood, without the intervention of foot-stalks. Besides this external variation, the wood of the last-named tree was darker, heavier, harder, and more elastic than that afforded by the *Quercus robur*, but it warped very much in seasoning, and was difficult to work. The *sessiliflora* was a denizen of the North of England, although sometimes found in the neighbourhood of London and elsewhere. Loudon, in his Encyclopædia, said that the name of "chestnut-oak" was given to this species because its wood was supposed by some to resemble that of the chestnut. Tredgold, again, said that the qualities of different species of timber must have been well understood by the Gothic builders of this country, for in the roof-beams of most of their buildings we found a very superior kind of oak, which closely resembled, and was often mistaken for, chestnut.

Mr. William White, F.S.A., said he believed there was good authority for saying that there was a third variety of oak, very hard in texture, and now almost extinct in England, which was in reality the oak of the Middle Ages.

Mr. Wyatt Papworth said this was a subject which he brought before the Institute in a paper many years ago,† and he was glad that the views he then advanced had been substantiated by Mr. Blashill. As to the test of weight, Mr. Blashill had stated that he found oak to weigh 43½ lb. per cubic foot, and chestnut, 33 lb., and in these figures he differed from Tredgold, who spoke of dry oak as weighing from 50 lb. to 53 lb. the cubic foot, while he put chestnut down as weighing from 34 lb. to 38 lb. He thought, however, that in spite of these discrepancies, the weight-test was a fairly good one, as the difference between the weight of oak and chestnut was very marked. About thirty years ago, a paper on the restoration of Greensted Church was read before the Institute, by Mr. T. H. Wyatt. The church, one of the oldest in England, has its nave formed of timbers which were stated by Mr. Wyatt to be of oak, but it had lately been stated that they were of chestnut. He had written to Mr. Wyatt and to the rector, but without clearing up the point. Mr. Papworth then quoted from the *Builder* for November 10th last the following lines from a paper read by the Rev. Canon Gee, read before the Watford Natural History Society :—

"Much of the oldest oak timber in this country is not of the same kind as that now in use. What we call oak timber now is the wood of the *Quercus pedunculata*. This has its fruit stalked and its leaves sessile. The other oak, the *Quercus sessiliflora*, has its fruit sessile and its leaves stalked. This latter is the oak which furnishes timber to some of our oldest buildings,—to St. Alban's Abbey and to Westminster Hall. The old wood is so unlike our modern oak timber in the absence or indistinctiveness of the silver grain, that it was long considered to be chestnut. . . . . At the Hospital of St. Cross, near Winchester, is some oak of a very singular dark grain,—commonly attributed to the way in which the wood was cut. The extreme length of each plank was only 5 ft., and it might all have been cut crossways."

Michaux, in his "North American Sylva" (1819) speaks of American chestnut as being strong and elastic and capable of enduring successive changes of dryness and moisture. In France chestnut was, according to Mr. Blashill, very largely used for timbers of buildings, but M. Viollet-le-Duc said he had not found any chestnut timber at all in Mediæval buildings.

Mr. F. P. Cockerell read the substance of some letters he had received from foreign members on the subject. M. Revoil, of Nismes, said he considered oak to be preferable to chestnut for all kinds of carpentry and joiners' work; and after oak, walnut, and then white poplar. Chestnut, he said, was never used in France for important roofs; oak would always be preferred. Burgundian and Norwegian fir were often used where oak would be too costly.

Mr. G. H. Birch said that in some parts of Brittany, the rafters and smaller timbers generally of roofs were frequently of chestnut.

Mr. Jackson, curator of the museum in Kew Gardens, said that there were three species of oak,—*Quercus robur*, *Quercus sessiliflora*, and *Quercus pedunculata*; but these three forms were now all placed by botanists under one species, and were all considered to be species of *Quercus robur*, there not being sufficient distinction between them to enable them to be regarded as separate species. As to the quality of the woods produced by the three trees, one ran very much into the other. He agreed with Mr. Blashill in thinking that the palette referred to was of oak. The American chestnut referred to was an entirely different species to the *Castanea vesca*, or European chestnut. True chestnut gave no silver grain. He knew nothing about such a wood as "chestnut oak." The chestnut was not indigenous to this country.

Mr. Armitage, R.A., said he had all his life studied entomology, and it was perfectly well known to entomologists that of all woods chestnut was freer from the ravages of insects than any other; in fact, there was only one species of beetle that ever attacked it. On the other hand, oak was attacked by myriads of all kinds of beetles and weevils. These facts might be of interest in considering the subject.

Mr. Blashill, in replying on the discussion, said he believed that the number of insects which fed upon oak was as nearly as possible two hundred.

Mr. T. Chatfeild Clarke then read a paper on "Popular Criticism as applied to the Architectural Profession," the substance of which, and of the discussion thereon, we give elsewhere.

* "The Question of Oak or Chestnut in Old Timber Roofs." See *Builder*, p. 490, *ante*.

† See *Builder*, vol. xvi., pp. 496, 528.

THE NEW COURT THEATRE, DRESDEN.

AT the commencement of the present year the opening of the new theatre in Dresden, mentioned by us at the time, was celebrated by a grand performance of Goethe's "Iphigenia in Tauris," at which representatives, not only of every German capital, but of most European countries, were present to testify to the interest which was felt far and near in the event of the day. The assistance of so many well-known friends and professors of native and foreign art was a compliment which this resuscitated temple of the Muses well deserved, as the particulars we are about to give of it will suffice to show.

The old Court Theatre, itself a fine structure, was totally destroyed by fire in the year 1869. As this was a State institution, it fell to the Saxon Government to replace it. Like most German Governments, they went very deliberately to work, and after a considerable interval they resolved not to rebuild the theatre on the old plan, but to construct a new edifice which should embody a number of improvements. The chief architect of the new theatre is Dr. Gottfried Semper, who holds an official position as *Oberbaurath*, or Superior Consulting Architect to the Saxon Government. The practical execution of the plans was, however, superintended by Herr Manfred Semper, an architect, and son of Dr. Semper.

The site of the new building, the same as that of the old theatre, is a very advantageous one, being on the Theatre Square, opposite the Catholic Church of the Court, and near the banks of the river Elbe. The general effect of the exterior of the new structure on the spectator is very impressive, — the form, the material, and the general treatment, all uniting to tell the purpose of the building, and impress the spectator as a monumental edifice.

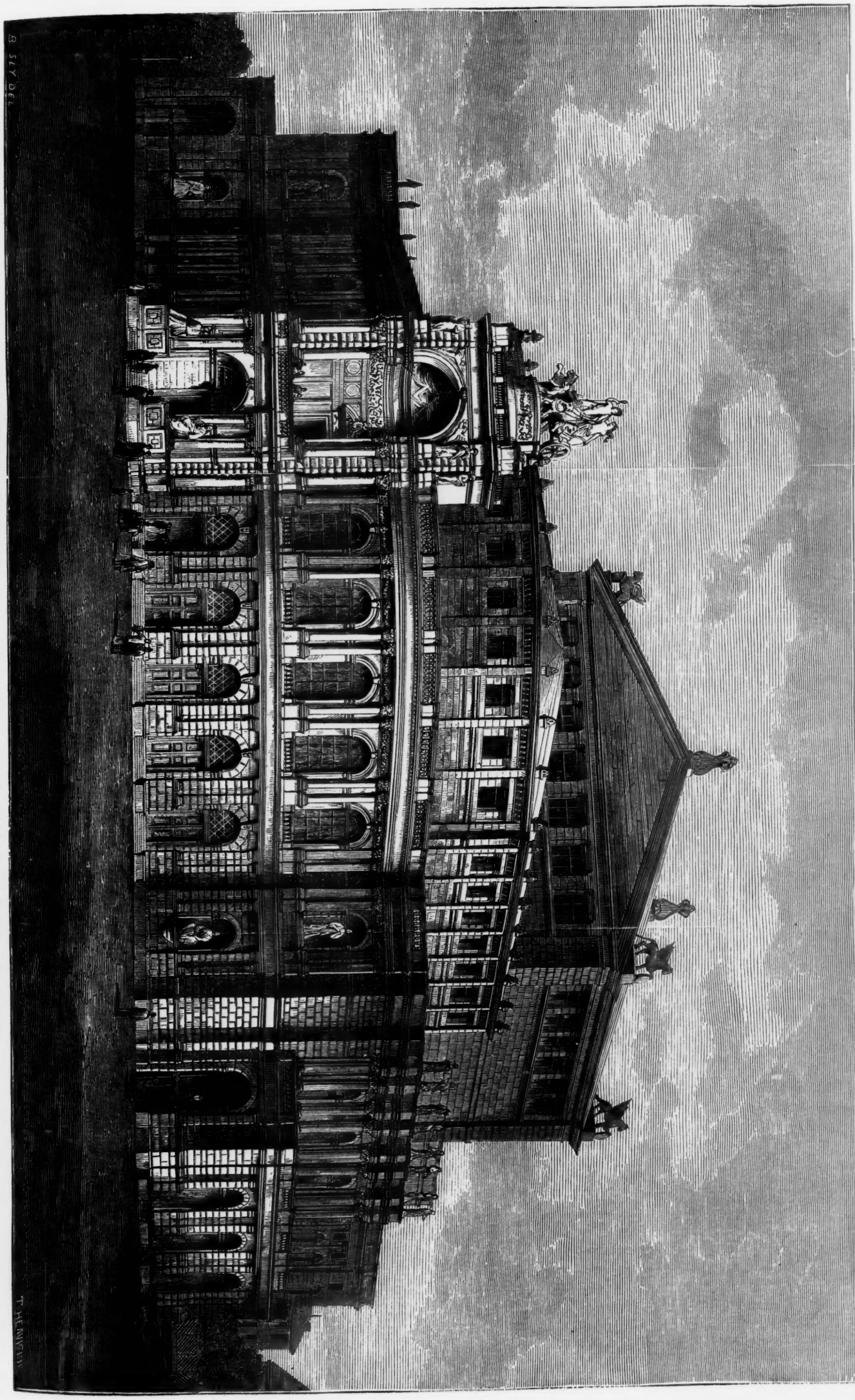
The fundamental form of the new theatre may be divided into three parts,—the stage, the auditorium, and the vestibule. Externally, each of these three divisions of the building makes itself visible in its outer shape and configuration. Standing out from the body of the edifice, the noble vestibule, with the chief entrance gaily decorated, in harmony with the character of the structure, seems to invite the spectator to enter the temple of art. Above the vestibule, and like it in the form of a segment, rises the auditorium; while the stage, crowned with gabled roof, far exceeds the rest of the building in elevation.

The chief front, which is given in our illustration, is opposite the church of the Court. The characteristic feature of this façade is the tower-shaped structure rising up in the middle of the segment, and in the main axis of the building, the effect of which is at once powerful and picturesque. This *exedra* marks the chief entrance, which is in the lower part; while above is a balcony or large niche, which overlooks the wide area of the Theatre-square below, and which, at public festivals or on grave occasions of State, may be expected to form the central point towards which the eyes of the multitude crowding the square beneath would be naturally directed. From the back of the balcony the spectator obtains a fine view of the interior of the house, through the entrance into the amphitheatre or dress-circle, and right across the auditorium to the stage itself. The walls and the semi-cupola-shaped roof of the balcony are richly decorated, the sides being in variegated marble, while the half-cupola above contains three great medallions of the Graces, Marsyas, and Apollo, executed in the ornamental style of Limoges enamel painting, by Herr Paul Kiessling. On the two sides of the chief entrance are statues of Goethe and Schiller; while above the cornices stand the statues of the four Muses, Thalia, Melpomene, Polyhymnia, and Terpsichore, the work of four of Schilling's pupils. Crowning the whole of this part of the building is a tasteful pedestal, upon which is a colossal group of Dionysos and Ariadne standing on a chariot, drawn by panthers. This effective group, which is by the master-hand of Schilling himself, is in bronze, while all the other pieces of sculpture on the exterior of the theatre are in stone.

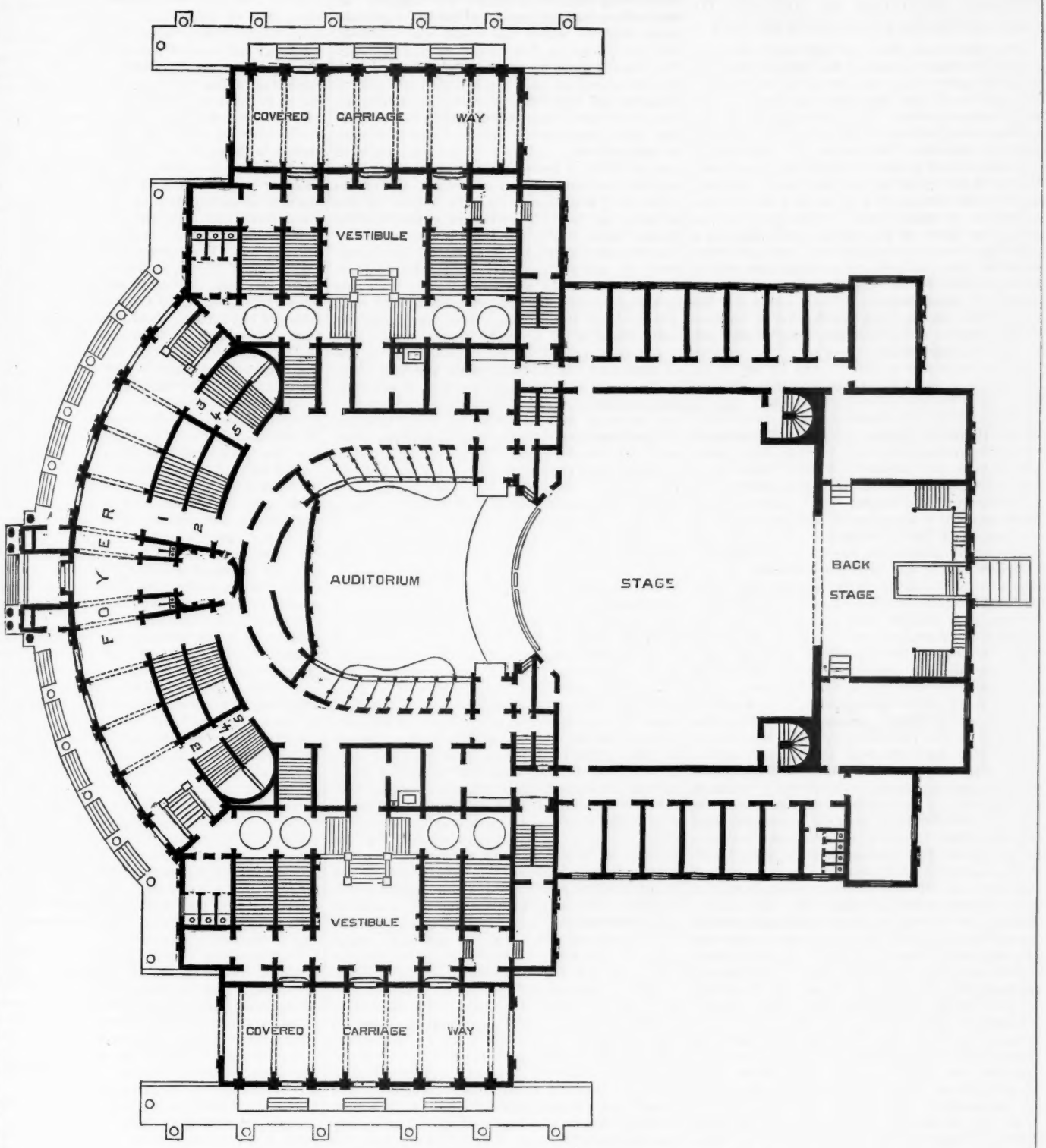
Right and left of the *exedra*, making a very flat or shallow segment, run the two *foyers* one above the other, ornamented, as in the old theatre, with the statues of Sophocles, Euripides, Shakspeare, and Molière, which, like the statues above mentioned, were uninjured by the fire. On each side of the building are the vestibules forming the general entrances, and which are approached by covered carriageways, and lead to the principal staircases. On the sides of the stage are saloons for the preparation and practice of the ballet, the chorus, robing-rooms, &c. All these side buildings are of the same height as that of the *foyers*, the only one that is higher being that of the back stage behind the stage proper. The dies above the grouped Corinthian columns, which are on the upper story of the side buildings, are occupied by a series of double statues representing typical characters in dramatic literature. On the one side we have Zeus and Prometheus; Creon and Antigone; Jason and Medea; and a Satyr and Bacchante. On the other side are Macbeth and Witch; Faust and Mephistopheles; Don Juan and Stony Guest; Oberon and Titania. The only objection to these statues is that they are too small for the situation in which they are placed. The hinder portion of the building and the exterior of the parts covering the stage are plainer, having little or no ornament. This is in harmony with the general plan, which, while it lavishes decorations on those parts of the building devoted to the spectator whose object is enjoyment, observes a rigid simplicity in the parts devoted to the actors whose object is serious business. Only four symbolical animal figures, with a lyre, decorate the four corners of the roof of this part of the edifice.

With respect now to the interior arrangements, on passing in by the chief entrance, we find ourselves in the lower *foyer* before the office, on the right and left of which are doors leading to staircases for the circles of the third, fourth, and fifth tiers. This *foyer* likewise connects the two side entrances and the buildings in which are the covered carriage-ways, vestibules, and main staircases leading to the seats of the first and second tier. These staircases lead on each side of the *parterre* vestibule to the vestibule on the level of the first tier, which, like the second tier, is connected by smaller staircases with the large upper *foyer*. The decoration of these ante-rooms is very appropriate and successful. Leaving the lower *foyer*, with its simple oak painting and slight gold ornamentation, we ascend the staircase, whose walls are of polished

THE NEW DRESDEN THEATRE: THE UPPER VESTIBULE.



THE NEW DRESDEN THEATRE.—DR. SEMPER AND HERR MANFRED SEMPER, ARCHITECTS.



THE COURT THEATRE, DRESDEN.— *Ground Plan.*

granite, and at every step the colours wax deeper and warmer. In the upper vestibule variegated marble prevails. Bright green columns on dark bases, and with white and gilt Corinthian capitals, support the stuccoed vaulted ceiling, which displays rich and picturesque ornamentation. The decoration culminates, in a joyous, festal tone, in the upper *foyer*, between the architecture of which and that of the vestibules the connecting link is found in its Ionic columns. The style here is that of the arabesques of the *loggie*, especially as developed by Perino del Vago in Genoa. The chief artists who have been engaged in these decorations are Professor Grosse, who, on the ceiling of the upper *foyer*, has painted the life of Dionysos as the original example of a hero of the drama; and Professors Hofmann and Gonne, who have painted in the neighbouring vestibule, the former an apotheosis of heroes of antiquity, and the latter an apotheosis of the heroes of modern romantic times. In the lunettes of this vestibule the scenes of great dramas and operas have been painted by some of the leading German architectural and landscape painters. The combined effect of the architecture of the building and the decorations is thoroughly harmonious.

As regards the auditorium, the shape is a semicircle, with rectilinear lateral prolongations. The area, exclusive of the orchestra, is 440 square mètres, and the number of the audience which can be seated is 2,000. The parapet in front of each tier is embellished with gold decorations, upon a sap green ground, producing a fine effect at night. The parapet of the first tier is further adorned with twelve medallions, representing busts of artists, by Schlüter. Exceedingly rich is the decoration of the ceiling, which, in connexion with the brilliant light of the great chandelier, with its 300 to 400 flames, forms a worthy finish to the interior ornamentation of the house. The space on the stage is considerably larger than in the old theatre, and coupled with its height it will accommodate comfortably any machinery likely to be required. The principal drop-scene is painted by Professor F. Keller, of Carlsruhe. A peculiarity of this new theatre is the iron curtain or shutter which can be let down in front of the stage, and will separate the latter from the auditorium and rest of the theatre entirely. This precaution was it need hardly be said, attributable to the disaster which rendered the rebuilding of the theatre necessary. As regards the acoustical qualities of the new building, they are found to be excellent, and as well adapted for musical and operatic as for dramatic performances. As a whole, the new theatre, both in its architectural details and in its decorations, is a great success. There are theatres which are more luxuriously finished, but there are none in which the general plan has been more harmoniously worked out or more artistically executed.

THE ROYAL ACADEMY.

SIR,—Owing to a careless mistake in the catalogue of the Royal Academy Exhibition, the mansion now building for Mr. Cave is assigned to Lord Eustace Cecil, and *vice versâ*. I have endeavoured by communications with Mr. Eaton to get the error corrected, but could only yesterday obtain information to the effect that nothing could be done until the next issue of the catalogue.

D. BRANDON.

POPULAR CRITICISM AS APPLIED TO THE ARCHITECTURAL PROFESSION.*

IT cannot with truth be said that the profession to which we belong has lacked criticism in these latter years, nor can it be denied that the tenour of such criticism has been in the main unfavourable. This depreciation of the architectural profession has taken two forms:—First, an assertion that the art of architecture has retrograded if it is not wholly lost; and next, that we have failed as practical men. Indeed, quoting the words of a writer in a well-known periodical it stands thus:—"The fact is," he says, "we have at present no such thing as a building art, this is entirely lost; we have what is called the profession of architecture, which, as it pretends to the practice of art, is in the nature of an imposture." And again:—"We have in the architectural profession a number of soft-handed gentlemen who may or may not be able to make sketches or plans, ... who prepare what are called designs in any style, and submit them to people ignorant of every style for their approval and acceptance." Again, as late as 1877, in a lecture on art, by a member of the House of Commons,† at the Whitehaven Scientific Association, the lecturer lays down two things for granted:—First, "That good reasons exist for considering the subject of architecture;" and second, "That those reasons are founded not upon the present perfections of art, but upon its imperfections; not upon the success of its professors, but upon their failures, notwithstanding the enormous amount of employment of architects in the present day,—notwithstanding the number of societies and institutions, and schools, that abound all over the country, the periodicals and speakers that deal with the subject invariably,—I may say universally,—declare that art and architecture have not progressed in our age, but that, on the contrary, they have retrograded." It would be easy to make further quotations. But, unfortunately for the profession to which we belong, the charge does not end there. The second form of the indictment is this: that architects are to a great extent untrue to the interests of their clients in the execution of their vocation, that they are far more anxious to execute commissions than faithfully to look after both the completeness and thoroughness of their buildings; it is constantly inferred, if not expressed, that they are far less anxious to keep down the cost of their buildings than they ought to be; that by the system of payment by a percentage on outlay there is a direct inducement to increase the expense of their works with its consequent results, and that the public ought to be warned against the delusion of employing "eminent names" in the works from day to day going on throughout the country. I must confess it requires a good deal of equanimity and dispassionateness of temper to hear these charges repeated so constantly as they have been of late years. It is to me a sign of a want of self-respect and regard for our calling, if we do not inquire into the truth of these reiterated statements, and endeavour to refute them; and I know of no subject so practically useful to the profession at large, as to boldly meet them, and court the fullest inquiry. There is little doubt that the action of some of the public departments in this country, by their treatment or avoidance of skilled architects, is giving a sanction of most injurious character to this tone of popular criticism, and the distrust shown in other quarters is indicative of the same feeling. It cannot be denied that the tone of such an acute writer as Sir Edmund Beckett, in his "Book on Building," is in some senses unfavourable to the architectural profession. It is in a great degree advice to the general public to protect or "hedge" themselves against showing any great confidence in giving a latitude to the architect in the execution of any given work; it is as much as saying,—"Be ever on your guard as to his crotchets; do not give him the fullest scope in his art-judgment; carefully see that the mind of the employer is open to negative, to correct, and alter anything where he may see fit to do so; in other words, consider the architect in relation to his work as in a measure the exponent only of the employer's mind." Upon the subject of the receipt by architects, as it was alleged, of illicit commissions, it cannot be denied that there was shown an "animus" in some of the leading journals of the day to readily insert charges where the proof was withheld from the public, or full details of the transaction; and it must be a source of satisfaction to the conscientious and straightforward practitioner to feel that those most cognisant with the large body of the profession would know at once that such charges were untrue. One fact must be acknowledged in reply to the two heads of charge which I have referred to, that spite the earnest recommendation of certain writers to exalt the "workman" into the sphere of the architect as the only sovereign remedy for the present state of art, it is the architect of to-day who is most interested in arresting the decadence of art-workmanship, and who has endeavoured in many ways to raise the workman to a higher aim and sphere, knowing full well, and feeling thoroughly, that the imagined antagonism is all a myth; that the true idea is for each and all to go hand-in-hand in the execution of the building with the aim of its entire completeness; and I express, I am sure, the unanimous view of the profession, when I say we wish well for every effort to raise the art workman,—nay, more, we will assist in every well-considered effort for this purpose. Dismissing, then, these side issues, we are brought face to face with the fact, paradoxical as it seems, that, notwitstanding all the depreciative criticism of the architectural profession, it flourishes: our towns and cities bear evidence which they never showed before to professional work in many a church, town-hall, market-house, or other building; and that no considerable structure is ever now undertaken without the services of an architect; and that if even a private house is built without the services of one, it is the general and candid acknowledgment afterwards that a great mistake has been made, and how many things could have been improved by the employment of a skilled man. Now to enter into the province of a careful criticism as to whether architecture as an art in the present day has retrograded, more especially as arising from the prevalent adoption of *one* style instead of *another*, would lead me too far, and I will admit this, that to expect the creation of genius or great originality in style or treatment seems, for the present at least, in any style, not possible. Whilst fully admitting this position, I do not think it affords any ground for unfavourable criticism specially as regards the architectural profession. It would apply to the whole field of art-design in painting, sculpture, or the like. The times in which we live, with all the material progress and the scientific resource as applied to art-manufacture, are probably by those very conditions unfavourable to that instinctive love of creative power which the history of the world shows to have been possessed in ruder ages and under very dissimilar states of society. But no good can possibly arise from depreciating the honest and genuine work of men who are consciously alive to the needs of giving to society the most chaste forms they know of, and who give most careful study to such forms of art as are most congenial to them. I think a candid and truthful statement of the position is this, that in all styles, whether Classic, Gothic, or what not, there is a large amount of careful and cultivated design produced, combined with sound building and foresight, and an amount of earnest thoroughness to develope any special line of art, that instead of laying the profession open to the charges of being a "soft-handed" and "dainty" body of gentlemen, careless of design, and "only seeking to trade on the ignorance of the public," proves the reverse to be the fact. I feel sure it is impossible to deny that taking a wide survey throughout England, and comparing the buildings of to-day with those of fifty or a hundred years since, there is a greater amount of scientific and artistic skill evident in them, and that architects have reaped a just reward in the increased demand for their services, as well as the confidence shown by the more enlightened portion of the public in their estimation of their works. The truth is, that despite the shortcomings of our practitioners, which none know more than themselves, there is an amount of conscientious and often loving work executed, for which the designer receives but scant acknowledgment, but which reflects lasting credit on himself. A test of some value with reference to the architectural profession, is the experience of those men who have built without the intervention of an architect, and who have trusted wholly to the builder. I am sure the experience of those who have done so (such cases mostly giving rise to litigation between the employer and builder before or after the completion of the work, either as to the mode of execution of the work or the cost) must be a lesson to those who would do likewise, and it is a most satisfactory testimonial to the value of the profession, that the builders as a body, though with some honourable exceptions, very much desire to evade the connexion of any building matter with an architect; their willingness to supply designs without cost to their employers, and estimates, being the delusive bait for future trouble and enhanced profits for themselves. With respect to the practical execution of works, and the allegations made under this head, it may be as well in a few sentences to explain what I conceive to be the relation of the architect and his employer. I hold that an employer or client once having selected the best man for the work he has in contemplation, must unhesitatingly and without reserve, for its success, give the architect his fullest and most complete confidence; under no other circumstances can the architect act with any chances of success, the desire to conceal from the architect any questions about ultimate cost, any wish on the part of the employer to be in a position to check his architect as to the nature and disposition of the design, and any leaning to prepare such a contract as shall place the architect in the contractor's eyes as a mere instrument of the owner, and not in the responsible, though difficult relation of a high-minded, but fair arbiter between the owner and the builder, will result in complications and final dispute. Accepting, then, that these are the terms of the true relation of an architect and his employer, what remains to the relation? Of course, the first step is that the owner should as intelligently, and with as much care as possible, instruct his architect as to all the wants and requirements of the matter in hand, and not leave, as it is too often the case, the architect with imperfect instructions, and at a later stage for the employer to complain that the design does not meet his wants. I hold, then, that a cultivated and careful knowledge of the necessities and general scope of the building required, when more fully understood by the public, would assist the architectural profession materially, though I doubt much whether that rather "fussy," "half knowledge," which goes still further, and which interferes with the detailed execution of works, does operate to the general success of the execution of the design as a whole.

Our accusers begin by believing and by charging, in the face of all evidence, a large and respectable body of men (doubtless with some exceptions) as being lost to their very first duty of moral conscientiousness and duty, in order to secure some paltry additional commission, and to secure some personal benefit to themselves. The charge carries with it its own refutation, and I dismiss it as unworthy of serious consideration. It will be maintained by some that the objections to the practical work of architects lie in quite another direction, viz., that of not meeting the special wants of a building, and often making it unsuitable to its end. Now, I will admit that I think the special training and exclusive study of one subject does very often unfit the mind to deal with modern wants as a whole, and that to some extent architects lie open to this charge. A wider general cultivation and a deeper interest in and mixing more with society in other relations would help rather than hinder architects in their special vocation, and they would be fulfilling far more truly the highest aims of life by taking their part in the general work of the world, and this wider knowledge of men and things is much to be desired; but then it should be remembered that this special interest in and devotion to their calling arises from a love for and an appreciation of its great claims. The real difficulties that beset the architect are the complex questions that arise in the use, especially in public buildings of appliances for heating, ventilation, and the like, and the varying conditions under which they are tested; the limitation of costs also must be borne in mind, the peculiarities of the site, the limiting and cramping nature of the instructions originally given in many cases, and the necessity of meeting the special wants of the head of some department at some sacrifice to the rest of the building. The public, who judge merely after completion, do not take into account these varied difficulties, and visit on the head of the architect the

* From a paper read by Mr. T. Chatfeild Clarke, before the Royal Institute of British Architects, on Monday evening last.

† The Right Hon. G. Cavendish-Bentinck. Reported in the *Builder* for 1877, pp. 187, 203.

special want or failure, as it may be; when, if the truth were known, the defects may have been the special point or difficulty he has been struggling with during the execution of the design. It may, I think, with truth and yet with modesty, be affirmed that there is no vocation connected with the arts requiring so mixed a class of qualities as that necessitated by the architect, which may be briefly summed up as follows:—A knowledge of the laws of design and style; a practical acquaintance with construction and materials; necessity for the considerations of cost and the requirements of modern society; the qualities of a man of business in the preparation and management of contracts; and a knowledge of the associated arts and mechanical and scientific contrivances forming a large part, as they now do, of all large structures. Can it be said, looking at much of the work in the present day, that any of these qualities are wanting, and, if so, where are the true grounds of complaint? The only further head I shall briefly touch on is, whether the attitudes of public departments, in relation to architecture and the non-recognition and want of direction by the State, is to be regretted or the contrary? No doubt the allegations so recently spread with regard to one special building must have had some foundation, and the result is to be regretted; but the question at once occurs, Are you, from any single case of the kind, to resort to a mode of carrying out public buildings which, in the long run, must be detrimental to public taste? Is it not within the cognisance of every one in this room that there are public buildings existing in the metropolis and elsewhere which, whatever their merits may be as regards *internal* convenience, cannot be deemed successful from an *artistic* point of view? It cannot be denied that the true attitude of the Government of any country towards art generally,—and of course, therefore, towards architecture,—is to give that encouragement, by the employment of competent men, as may best conduce not only to develop taste among the people at large, but also to give the most permanent examples of good art to the nation for after-ages to rest upon. Not in any way necessarily confined to one style or another, but by a catholic and liberal judgment, and consideration of all schools of art entrusted to a Minister of State, would be the right way of developing art in this country, as I venture to affirm. It is a trust reposed by the people in the Government of the day for the benefit of the nation, to wisely deal with an expenditure raised by taxation, and in the scant recognition of, and evident desire to avoid, the services of high-class professional men, shown in some recent inquiries, it becomes specially necessary that the public should be alive to the probable result of leaving large works to mere departmental officers, or to their supernumeraries, the training and education of such men being, doubtless, amply sufficient to know and detail the accommodation required, but unfitting them to design buildings which should become national monuments. Of course, the objection raised that the appointment of any such Minister as I have indicated would result in a series of attacks upon him, should be put aside, if we are convinced that the course is a right one, though he must be a man with the force and power to maintain his views with reason and ability. The further objection that any extensive patronage of art would in the end lead to its decay and destroy healthy competition and the growth of art generally, is not applicable to the view I am urging, for I should deprecate any large or active interference beyond the wants of the national work, and specially should deplore the cramping influence of any particular school. To sum up the results of my paper, then, in one word, I would say this, that the charges so freely made against us are "not proven"; that in art work, in conscientious discharge of their duties, and in repudiation of any graver insinuations, the profession can stand the fullest inquiry, and that it is not undesirable by the means of the press, the lecture-room, public speech, and otherwise, for the profession to show that they are prepared to maintain their own position, and to submit frankly their claims to the public at large, who with generosity and fairness always deal with a question they fully understand.

In the discussion which followed,

Mr. Boulnois said he thought any observations on the paper would be best ordered by a *clôture*, for there was not a man in the room but felt humiliated at times by his own mistakes, and the mistakes of his brethren. He thought the less they found fault with people who criticised them the better. They should remember that one great principle of art was "*ars est celare artem.*" If they could not stand upon their own merits as artists and architects, they would not do any good by puffing themselves and each other,—"Ca' me, ca' thee," as the Scotch had it. Any discussion on the topics treated of in Mr. Chatfeild Clarke's paper could only result in bombast and self-laudation. The attacks made upon the profession had been thoroughly answered. In fact, the Institute had that very evening elected a gentleman (Sir Edmund Beckett) who, in spite of the hard things he had said of them, showed his appreciation of the profession by coming amongst them. They did not stand under the necessity of "whitewashing" themselves. In fact, any discussion having that object could only end in bombastic platitude on the one hand, and in "Ca' me, ca' thee," on the other.

Mr. Ewan Christian expressed concurrence in these views.

Mr. Hansard having moved a vote of thanks to Mr. Clarke for his paper,

Mr. Kidner said he could not agree with Mr. Clarke in thinking that criticism by the public was undesirable; on the contrary, he thought it very desirable. As to the vaunted progress of architecture as exemplified in the streets of London and other large towns, he could only say that having been absent from England for nine years, and having read during that period of what was being done in London and elsewhere in the way of opening out new streets and the erection of new public buildings, he had looked forward with considerable pleasure to his return, so that he might inspect the progress that had been made. He must say, however, that he was considerably disappointed at the way in which these great opportunities had been either totally lost or only partially turned to account. The old works that he was taught to admire when a youth were still the best works to be met with. He believed that one cause of mediocrity in architecture was to be found in the constant craving, on the part of the public, for novelty. Architects would never advance their art so long as they pandered to that craving, which was a prolific source of vulgarity.

The President said Mr. Boulnois had succeeded in effectually extinguishing discussion; but while his avowed object had been to deprecate self-assertion, it would be hard to conceive of a more distinct act of self-assertion than to refuse to reply to public criticism on the ground that the public had nothing to criticise. Such procedure was akin to that of the ostrich, which, burying its head in the sand, thought that no one could see it. In point of fact, there generally was, in all cases where architects were attacked or criticised, some slight substratum of justification; in other words, such charges were largely false, but slightly true. At the same time, he thought that architects might fearlessly point to the results of architectural practice during the past twenty-five years, and with confidence compare those results with those obtained during any preceding twenty-five years between the present time and the famed thirteenth century. Reference had been made to the election, as Hon. Associate of the Institute, of one of the most unsparing critics of its members, Sir Edmund Beckett, and the inference had been justly drawn that Sir Edmund did not think them very bad fellows, or he would not desire to come amongst them. Now, although Sir Edmund flattered himself that he knew a great deal about architecture, and was very unsparing in his criticism of architects, he was ever ready to tender his advice to those who, as he said, were foolish enough to take it, always to employ an architect. Reference was also made by Mr. Chatfeild Clarke to the action of the Government in relation to architects, and surely that was a point which should not be allowed to pass without notice. In this connexion it was satisfactory to note that in the new class of Honorary Associates the Institute now included as its members the First Commissioner of Works, and the Secretary to the Office of Works, and it was to be hoped that one result of the interchange of ideas between those gentlemen and the members of the Institute would be to impress upon Government departments the necessity of taking counsel with skilled and responsible architects with reference to the erection of new public buildings, rather than to trust to departmental officers, who, however anxious to do their duty, had usually but limited experience as architects. As to builders, he thought architects had a great deal to be ungrateful for, to use no stronger word, to Messrs. Cubitt (not the present firm of Cubitt, but that of Thomas Cubitt), because they knew how to do their work so uncommonly well, as far as the practical part was concerned, that their houses would compare favourably, as structures, with some houses that had been erected under the supervision of architects. The high character of the work in these houses gained for "builders' houses" generally a reputation by no means universally due to them.

Mr. Chatfeild Clarke, in replying on the discussion, said he could not lay the flattering unction to his soul that Mr. Boulnois was able to do. It was not enough for them, ostrich-like, to hide their heads in the sand.

Mr. Boulnois said that, on the contrary, it was because they could not hide themselves in the sand that it was very much better that the members of the Institute should not discuss these questions amongst themselves.

Mr. Chatfeild Clarke said he, for one, was not prepared to take that advice, and to allow to pass unchallenged the kind of criticism of architects which was now indulged in daily in almost every dining-room in the country. The depreciatory criticism of architects was on the increase, and it ought to be met; and a body of professional architects like the Institute ought to be prepared to make a stand against what was becoming a serious evil. The passive attitude advocated by Mr Boulnois had been tried long enough, and it had utterly failed; and it was now high time to take another and a bolder course.

The meeting closed with the announcement that the Architectural Conference would commence on Monday, June 3.

THE LATE MR. M. THOMPSON, ARCHITECT.

WITH regret we hear of the death, from rheumatic fever, of Mr. Matthew Thompson, F.R.I.B.A., of Newcastle-upon-Tyne, which occurred on Friday night, the 17th of May, at seven o'clock.

Mr. Thompson, of the firm of Thompson & Dunn, of Newcastle, commenced his career in the office of Scott & Moffatt, of London, and was for some time manager for the late Sir Gilbert (after the dissolution of partnership with Mr. Moffatt). About this time he gained both first and second premium (the latter of which he resigned in favour of the owner of the third set of drawings) for the well-known hospital buildings seen by travellers on the North-Eastern Railway near Durham station. This, we believe, was the first thing to draw him again towards his native town, where he soon commenced a bright career, which has been lamentably cut short at the age of fifty-five. Mr. Thompson was an active member of the Town Council of Newcastle, also of the Northern Architectural Association, of which he has been president upon more than one occasion. His death will cause much sorrow, and be a great loss to Tyneside and North-country architects, as well as to the young men who have gone forth from his offices in Eldon-square, mostly to start business for themselves in the North of England.

Mr. Thompson was some fifteen or twenty years ago appointed architect for the Duke of Northumberland's Northumberland estates. Many of the important buildings of Tyneside are his works, including several buildings in Newcastle streets, West Grainger-street, &c.; churches at Morpeth, Gamesley, Birtley, Alnmouth, and in Newcastle in Blacket-street and St. Thomas's-place; also several chapels; mansions at Dipton, Stagshaw (for Mr. J. Straker); Grinkle Park (for Mr. C. M. Palmer, M.P.); Rectory, Bothal; Workhouses at Houghton-le-Spring and Chester-le-street; stabling of note in Newgate-street, Newcastle (for Mr. Stephenson); breweries, Houghton-le-Spring (for Mr. Robinson); besides an innumerable list of private residences in Newcastle, Tynemouth, and the neighbourhood.

Scott Memorial Committee.—We notice that considerable effort is being made to raise a memorial to the late Sir Gilbert Scott, R.A. A public meeting will be held in the Chapter-house, Westminster Abbey, on Saturday, June 1st, at four p.m., when the Duke of Buccleuch is expected to preside.

THE USE OF SEWAGE BY FARMERS; OR FIFTY INSTANCES OF PROFITABLE SEWAGE IRRIGATION.

AN important paper under this heading, by Mr. R. W. Peregrine Birch, Associate, was read at the ordinary general meeting of the Institution of Surveyors, on the 13th inst. In this paper, addressed to the Institution of Surveyors (which is understood to represent the management of something like three-fifths of the landed property of England), the subject was treated from an agricultural point of view. Articles, the writer said, have been printed in London newspapers, and tables have been published in books upon sewage disposal, one after another, all showing that the attempts of sewage companies and local boards to use sewage, make it portable, or put it out of the way, have alike resulted in an expenditure of upwards of a shilling a head per annum; and this, although sewage contains materials which, but for their encumbrance, would produce an income of 10s. per head a year to the ratepayer. What has been truly said and written upon the subject has had the effect (as might be expected) of making local authorities cautious and slow to take any action. This is probably as it should be. Let owners or occupiers of agricultural land, however, not be alarmed at the failures of local boards or public companies, but rather see that therein is their opportunity to come forward and help the public with considerable and increasing advantage to themselves.

That the use of sewage has proved advantageous to a large number of agriculturists appeared from the notes collected.

We print Mr. Birch's deductions and the concluding passages of his very valuable contribution towards the settlement of an important question:—

"From the foregoing it appears:—

1st. That there are upwards of 100 owners and occupiers of land in Great Britain who use sewage for the sake alone of what they can get out of it by agricultural means.

2nd. That of this number more than sixty are tenant farmers who continue to use it, although they have, annually at least, the option of ceasing to do so.

3rd. That of the latter number about five-sixths, and of the total number about three-fourths, actually pay money for the use of the sewage, either in the form of out-fall rent, unquestionable increase of land-rent, or the price of occasional dressings.

Nearly 4,000 acres of sewage land have been referred to, and these are in the hands of more than 100 distinct occupiers. These occupiers may be divided into three classes:—

Those who have to cleanse a certain quantity of sewage on a certain area of land;

Those who may take, or leave alone, as much of a town's sewage as they please; and

Those who may take, or leave alone, what sewage can be spared by others having a prior right.

The first class occupies 1,670 acres of sewaged land, and deals with the sewage of twenty distinct sanitary districts, or a population of about 200,000, on as many as twenty-one different farms.

Of these twenty-one farms, twelve are let by local authorities to tenants who undertake to cleanse the sewage as well as use it for their own purposes; and nine are held by persons who take the sewage on their land for no other reason than that they believe their holding will be benefited by it. Now, it is a fact deserving the notice of local authorities, as well as private users of sewage, that while ten out of the twelve authorities having sewage to use manage to become owners or lessees of *arable* farms, six out of the nine agriculturists who take sewage with all its liabilities for the sake only of fertilising their land happen to occupy permanent grass-farms. Now, taking the second class, composed of persons using as much or little sewage as they please. These are sixteen in number, and, with the sewage of about a quarter of a million people at their command, irrigate amongst them nearly 1,500 acres.

This area, with the exception of part of the Edinburgh land, about an acre of osiers at Tyldesley, and part of the Handsworth land, which bears rhubarb, is entirely occupied by permanent grass. The difference between this class of sewage user and the first consists in this: one having the power to pass the dirty water on if it is not wanted, and so neglect to prevent river pollution, and cast the duty on some one else. It is of the highest importance, therefore, to establish what are the periods during which the interests of the unfettered sewage-farmer dictate that he shall let any one else have the sewage for better or worse.

At Crediton, where sewage is only put on grass land, it appears to be passed on during "most of the summer."

At Devizes, it is not used while the hay is tall or being made.

At Edinburgh, three watermen are employed in summer to irrigate the Craigentinny Meadows, and one in winter.

At Handsworth, it runs on grass land all the year round.

At Leek, the outfall, commanding meadows only, discharges on to those meadows during the whole year, except about six weeks or two months, when the growth of the grass prevents access to the channels without damage to the crop.

From Mansfield, the Duke of Portland's bailiff, Mr. Woods, kindly reports that there is no season of the year at which the water cannot with advantage be turned on to the Clipstone Meadows.

At Plympton, the occupiers of Lord Morley's meadows are "crazy after the sewage," excepting during two or three months in the summer.

At Waltham Abbey, the town mead is irrigated from the middle of September till the beginning of May, when the occupier of the adjoining market gardens takes the sewage.

These few notes show that the grass farmer can, without any scheming, do with sewage till May. Then comes the very important note from Leamington, where Lord Warwick has produced sewage-grown roots to win ten silver cups and a number of money prizes, that "Root crops, with the exception of cabbages, never have sewage applied to them before May or June." And another from Arle Court Farm, Cheltenham, where many prize mangolds have been grown, that Mr. Wood had mangold on the same ground five years running.

Now, the third class, into which sewage users have been divided for the purposes of this paper, includes some sixteen or eighteen farmers at Leamington and Cheltenham, who, together irrigate about 500 acres of land when the sewage can be spared to them. For this advantage they have been found ready to pay nearly 200*l.* a year, besides doing such work as the land may require before it can be irrigated. What has been done at these two places goes principally to show that a farmer can, under a great variety of circumstances, if he chooses, try a dressing of sewage on his field (whether arable or pasture) without any such outlay as would only be justified after he had determined to irrigate permanently.

To any one desirous of trying the use of sewage on his land, but unacquainted with the practice, it will be satisfactory to learn that at no place mentioned (with seven exceptions) do the surface carriers, great or small, consist of anything but spade or plough cut channels. At Aberdeen and Guisborough, however, they are made of earthenware channel-pipes; at Penrith channel-pipes are used for the permanent carriers, and portable wooden spouting is used for branch purposes. These both appear troublesome features,—the one to keep in repair in a field occupied by cattle, the other to use; and their merit is by no means apparent. At Altrincham channel-pipes were laid, but have, in a very large measure, been removed in favour of the simple grip. At Swinton the land first laid out had channel-pipes; but in extensions spade-cut furrows have taken their place. At Wrexham solid channels are only used where the necessary proximity of their position to that of a pure watercourse makes them desirable, or where the gradients are so steep that channels simply cut in the ground would not stand. And at Ware the main carrier consists of a wooden spout packed up on legs or laid in the ground at regular gradients, and from this the sewage is carried on to the land, as at Penrith, by means of smaller portable spouting.

The amount of alteration required by the surface before land can be satisfactorily irrigated with sewage must, of course, vary with localities; but what has been done at Leamington and Warwick by some fifteen users of sewage, both on meadow and arable land, as well as at Chorley, and several of the places where grass-land has been irrigated, proves that, under very varying conditions, it is practicable to irrigate land with the same surface that has been given to it by the process of ordinary farming.

Besides the cost of great levelling operations, the tendency they have to rob parts of the surface of its share of soil is a decided disadvantage. Few accurately levelled fields of rye-grass are free from patches of a yellowish colour, which, on investigation, turn out to be due to want of soil.

From what has been said about tanks, it is plain that they are only useful under certain circumstances, and that they require careful handling, to prevent their being a nuisance.

Upon the question of whether or no it is dangerous to graze and irrigate land at the same time, much valuable evidence has been adduced on the negative side, while none to the contrary has come under the author's notice.

That heavy, as well as light, land may be profitably irrigated has been proved at Cheltenham, Crediton, Chorley, Leamington, and Swinton. It must not, however, be wanting in drainage; but if land be sufficiently drained, either naturally or artificially, for advantageous farming without sewage, it is sufficiently drained for the most advantageous use of sewage. Heavy land, however, under sewage, should be laid down in pasture, for sewage adds considerably to the labour and difficulty in working it.

Climate has, no doubt, considerable influence upon all agricultural phenomena, but no variety to be met with in this kingdom south of Edinburgh seems to be inconsistent with the profitable use of liquid sewage. The meteorological character of the country varies very considerably between Edinburgh and Plympton; for, while the average annual rainfall at the latter place must be nearly 50 in., that of Edinburgh is under 30 in., and places situated at intermediate latitudes, where sewage has been profitably used, have annual rainfalls varying from the 25 in. registered at Chelmsford and Guisborough, to double that amount at Penrith, Cockermouth, and Cleator Moor.

The question of whether the separate system of sewerage is desirable or not requires a few words. It concerns principally those who are obliged to cleanse all the sewage that comes to them. There are twenty-one such cases referred to, and the author is in a position to know that, in fourteen of them, those most interested would gladly see storm waters kept out of the sewers. Thirteen of these gentlemen, including Mr. Blackburn, Colonel Jones, Admiral Chaloner, and Captain Fosbery, speak from experience of arable farms, and there can be little doubt that they are right; but with grass land the question is not of such importance. Subsoil water, which makes a less varying addition to the flow of sewage, is probably always an advantage to the sewage farmer, provided only he has enough land for the advantageous utilisation of all the manure contained in the sewage he has to deal with.

The sewage of a town has never probably been spread over enough land for its complete utilisation; and one thing that must always make this difficult, in the majority of cases, is the absence of available water in sufficient quantities to spread the sewage where it is required in summer, and to irrigate the already highly-manured land, which requires moisture rather than manure. It is plain from the table referring to the Leamington farm that, in the field which received nearly 15,000 tons of sewage per acre, between the 8th of February and the end of August last year, a very large proportion of the manure must have been wasted, for, supposing the average manurial value of the refuse of the Leamington population to be 10s. per head per annum, then the value of the dressing per acre would be about 107*l.*, which is, probably, at least four times the value of the crop that it could produce.

"Sewage sickness" is a term that has become common, because it sounds appropriate; but, as a matter of fact, time has no effect in making land "sewage sick," for its pores may be filled, as at Edinburgh, year after year, with infinitely more dissolved manure than can possibly be made use of by vegetation; and the land will continue to be as productive and as capable of receiving sewage as ever. A crop may, however, be ruined if it is covered with sewage, even although it may not have had enough for its manurial requirements; or land may be done more harm to than good temporarily by one single ill-timed dressing. Experience has proved that over-feeding with sewage for years has no ill effect, although land may be choked with it in one meal.

At none of the places mentioned, excepting one, has the use of sewage involved the user in

litigation. The Ware Local Board were, however, a few years ago, summoned before the magistrates by the Lea Conservancy, who alleged that sewage was allowed to run over the surface of the ground into the river, but the case was dismissed.

The object of this paper has been to lead to an increase in the present number of sewage farmers. If this is to come about largely, sewers must be laid out with a view to commanding by their outfalls (or by outfalls that might be made if required) the greatest area of land, and the greatest number of agricultural properties or holdings. And would-be sewage farmers must bear in mind that there is a large variety of circumstances under which it would be possible, and very advantageous to a town, to send part of its sewage to a farm, although that farm may be at level considerably above the general outfall level of its whole system of sewers.

Advocates of sewage precipitation processes should not regard sewage farmers as their rivals; for a chemical process might be very largely used with advantage where farmers are being persuaded or taught to use sewage. But this should be the distinct aim of all authorities; for there is no chemical process that could not be worked to greater advantage during two months of the year than twelve, or applied to a small quantity of sewage at less cost than to a large."

PURCHASE OF WATERWORKS.

THE Middlesbrough Town Council had a special meeting last week in respect of the compulsory purchase of the works of the late Darlington and Stockton Waterworks Company, and some dissatisfaction was expressed as to the award made by Mr. W. H. Higgins, the arbitrator.

The total ascertained cost, leaving out the expenses of the arbitration, is 824,338*l.* divisible between the Middlesbrough and Stockton Corporations.

The amount before the award was made was estimated at 500,000*l.* or 600,000*l.* Some of the council wished to back out of the venture, but eventually it was agreed to pay their share in a lump sum from a special rate.

The Stockton Corporation were alike dissatisfied at having to pay some 200,000*l.* more than they looked for, inasmuch as the Waterworks Company had, in 1875, offered to take 550,000*l.* for the undertaking. A comfortable margin for three years' patience is apparent here.

FINE ON THE CORPORATION OF ST. ALBAN'S FOR RIVER POLLUTION.

THE Corporation of St. Alban's have for some time been the defendants in an action brought against them by Mr. Woollam for polluting the river Ver with sewage matter. The case was again before the St. Alban's County Court judge, Mr. Whigham, on Saturday last, on an application on the part of the plaintiff for the defendants to be fined 50*l.* a day for every day during which they continued to pollute the river Ver with sewage matter.

Mr. Dumville, Deputy Clerk of the Peace for the county of Herts, argued the case very fully on Saturday, and complained of the conduct of the defendants in not proceeding as expeditiously as they might have done with a remedy for the evils complained of.

At the close of the arguments, the Judge made an order for the Corporation, as the Urban Sanitary Authority, to be fined 25*l.* a day, to be paid at such date as the Court might direct. Liberty was, however, to be given to the defendants to apply three months hence for the order to be rescinded, on proof being given that care and despatch had been used in the preparation of a scheme for preventing the continuation of the offence, and that such scheme will be carried out without delay.

ASPHALTE.

SIR,—In your Paris letter, published in your issue of the 11th inst., you say,—"The asphalte used by the French seems to have excellent setting powers; it is scarcely laid down ere it becomes perfectly hard, setting almost as quickly as plaster of Paris."

Will you kindly state in your next issue that the compressed rock asphalte laid in Paris is from our mines in the Val de Travers, and that we supply precisely the same rock to the Val de Travers Asphalte Paving Company, Limited, of London, who have laid it in Cheapside, and a great many other streets.

HENRY R. BRADBURY, Secretary.
Neuchatel Asphalte Company.

THE PARIS EXHIBITION.

THE works are progressing, and there are plenty of fine things for the visitor to look at; but the Exhibition, as a whole, is still far from complete, and will be so for some time to come. A quietness and apathy which are not agreeable are apparent to those who remember some other international Exhibitions, but the interest will probably increase. Some of our readers may be glad to know that the "Catalogue of the British Section," in two parts, is obtainable at Canada-buildings, King-street, Westminster. The first part contains the fine-art sections, and includes much interesting information.

An international sanitary congress is to be held at the Trocadéro from the 1st to the 10th of August. Among the questions discussed will be the pollution of rivers, adulteration of food, artisans' dwellings, unhealthy manufactures, and isolation in hospitals. M. Bardoux will ask the Chambers for a vote of 100,000f. to enable elementary schoolmasters to visit the Exhibition and hold a conference.

PROPOSED NEW FLOATING BATHS, AND A MIDDLE-CLASS SCHOOL FOR GIRLS, FOR THE CITY.

THE Law and City Courts Committee of the Corporation have just recommended that the Corporation should expend the sum of 15,000*l.* in the construction of a floating bath for the City, out of the sum of 60,732*l.*, which is now at the disposal of the Corporation, arising out of the bequest of the late Mr. T. A. Mitchell, M.P. for Bridport. In their report the committee state that they had had strongly urged upon them the desirability of a portion of the fund being applied to constructing a floating-bath upon the Thames for the use of the citizens. It was said that if 15,000*l.* were expended on the erection of the baths, they would prove self-supporting by a small charge only being made for their use. They had ascertained that the working expenses of the new bath would be about 800*l.* a year, and that therefore a very small fee would suffice, as there would be no interest to be charged on capital expended. The bath would provide ninety boxes. Out of the residue they also recommended the establishment of a middle-class school for girls, similar to that for boys in Cowper-street. They had ascertained that the cost of a building capable of receiving 800 girls might be calculated at 30,000*l.*, and of the site 5,000*l.* The estimated annual expense of the teaching staff was 6,000*l.*, to be met to a great extent by the payment of a small annual fee by the pupils. It was also recommended that there should be an endowment for the repair of the fabric and for prizes, and that 20,000*l.* out of the fund should be set aside for that purpose.

THE READING WATERWORKS.

THE new waterworks at Fobney have just been opened. The need of an additional supply has been felt for some time, but with the view of deferring the construction of new works as long as possible, the Waterworks Committee effected a few years ago various reforms and improvements in the management of the works, with very satisfactory results. The general inadequacy, however, remained evident, and the Council subsequently requested Mr. Mansergh to report to them upon the matter of water-supply. Mr. Mansergh proposed a large scheme, embracing storage reservoirs of increased capacity and elevation above the town, but still retaining the principle of filtration at the Bath-road reservoir, the defect of which is that the rate of filtration varies with the rate of consumption, and is, therefore, not uniform. During the night very little filtration would be going on, whilst at some periods during the day the rate would be very excessive. The Council ultimately decided to adopt a scheme recommended by Mr. Donaldson, which had, however, been previously submitted by him to Mr. Mansergh. By this scheme the whole of the filtering will be done at the site of the pumping-station at Fobney before it is pumped, and the rate of filtration will be uniform day and night. The outlay will be considerably less than half the cost of the scheme proposed by Mr. Mansergh. The works may be thus described:—By the negotiations connected with the works for lowering the River Kennet, carried out in 1874-5, the Council became possessed of the water-power at old Fobney Lock, the fall being by the same works increased by 3 ft. It is this fall that has been utilised in the new waterworks. On the site of the old lock has been erected a mill-race, in which are fixed two turbines or horizontal water-wheels. Owing to the deep foundations necessary, and the peculiar situation and treacherous nature of the ground, very great engineering difficulties were encountered in this part of the work, but they were all successfully overcome. Over the mill-race is erected a spacious building, in which is enclosed the pumping machinery. The pumps are four in number, and are all of double action, working horizontally, direct from the vertical shafts of the turbines, by a very simple and effective arrangement. Close to and connected with this building is the cottage for the keeper of the works, with all necessary outbuildings. Beyond the buildings, and to the north side of the new head-race, conducting the river to the wheels, are the filtering appliances. These consist of the intake chambers, two large subsiding reservoirs and three filtering-beds, giving a filtering area of nearly three-quarters of an acre. There are also the clear well and the network of pipes, &c., conducting the filtered and unfiltered water to their destinations. The rising main, or line of pipes through which the water is pumped to the old reservoirs, after leaving the pumps, strikes direct for the Bath-road, taking its route through the Fobney meadows, the lands of Mr. J. B. Monck, Coley Park, and Mr. Blackall Simonds, and continuing along the Bath-road to the reservoirs. Here it is also connected with the Whitley reservoir mains, and in an underground chamber is fixed an automatic valve, the invention, we believe, of Mr. Donaldson, which will regulate the pumping to the respective reservoirs. An electric cable is laid along the line of pipes, with call-bells at either end, in order that the waterworks manager at Bath-road may have communication with his assistant at Fobney.

The whole of the works have been designed by and carried out under the superintendence of Mr. Donaldson; Messrs. Cochrane & Co., of Dudley, and London, were the contractors for the supply of the iron pipes; Messrs. James Watt & Co. (late Boulton & Watt), of Birmingham, Limehouse, and London, for the turbines and pumping machinery; and Mr. George Munday, of London and Limehouse, undertook the construction of the rest of the works.

THE GOVERNORS OF DULWICH COLLEGE AND BUILDING IN CROXTED-LANE.

ALLEGED SPOLIATION.

THE governors of Dulwich College contemplate laying out the neighbourhood of Croxted-lane for building upon. Croxted-lane is one of the picturesque parts of West Dulwich, and it is alleged that its being interfered with for building purposes would involve the destruction of a large number of trees, and deprive the public of the use and enjoyment of one of the most delightful lanes in Dulwich. A meeting of the inhabitants of the district has just been held for the purpose of memorialising the governors of the College estate to preserve the lane for public use, as well as the trees at present standing there. The chairman of the meeting (Mr. Cummings) observed that they were all quite agreed as to the beauty of this lane, and that there was no spot near London more admired. Even royalty had enjoyed the prospect, and in old times it was a well-known resort for artists. They must, therefore, feel that in this case the difference between the lane and bricks and mortar was very great indeed. Adverting to the alterations which it was suggested the governors should make in their plans, the chairman observed that one great advantage to their land was the delightful prospect of that place which tempted visitors to purchase land for the purpose of erecting houses near so fine a view. He thought, therefore, that the governors, if they carried out what they meditated, would not only suffer a loss of the prospect, but a loss of revenue as well. By the plan which it was proposed to submit to the governors the prospect would be preserved, whilst they would eventually derive a considerable profit from the alteration. Mr. Mare proposed the following resolution, "That the ancient footway known as Croxted-lane, and used by the public from time immemorial, is one of the most picturesque features of West Dulwich, and that it is therefore desirable, as far as possible, to preserve its rural character." The speaker observed that his resolve to purchase a house on

the estate was induced by the rural aspect of the spot, and that if he had known that it was going to be covered with bricks and mortar he should not have made the purchase. The resolution was unanimously adopted, as was also another resolution to the effect that the erection of buildings on the narrow strips of land between Croxted-lane and the London, Chatham, and Dover Railway would destroy the picturesqueness and rural character of the whole neighbourhood, and also irretrievably destroy the future value of a large portion of the Dulwich College estate.

ST. BEDE'S (R. C.) COLLEGE, MANCHESTER.

THE memorial stones of St. Bede's Roman Catholic College, Alexandra-road, Manchester, were laid on the 16th inst. The college, which was recently founded by Dr. Vaughan, the R.C. Bishop of Salford, is designed to provide for the sons of gentlemen such an education as is calculated to fit them for success in professional and commercial life. The new buildings for the college, of which the south wing is now being built, are designed by Messrs. Archibald Dunn and Edward J. Hansom, architects, of Newcastle-upon-Tyne. The building, formerly known as the Manchester Aquarium, having, with the surrounding grounds, been purchased by Dr. Vaughan, the problem to be solved was to incorporate the building with the new parts necessary for carrying on the work of such a college. The plan consists of one long block of building, broken by pavilions at either end, running parallel to the Alexandra-road, and facing the Alexandra Park, slightly in advance of the present front of the Aquarium (which it will mask) and making the old building the central hall. In plan the whole resembles the letter T inverted. The central hall will be kept as the exhibition room and museum, also for meetings, &c. In the centre of the college, and immediately in front of this hall, is the entrance and grand staircase leading to the first floor. On either side extends the new front, which will contain the study-room (65 ft. by 23 ft.); playrooms, 43 ft. by 29 ft.; libraries and class-rooms, 25 ft. by 23 ft., &c. In treating the exterior the architects have adopted the style of the Italian Renaissance. Red brick and terra-cotta are the materials used in the construction, the details of the windows, cornices, &c., being carefully studied and ornamented with modelled enrichments, which, being repeated in terra-cotta, do not entail great expense, and in fact cost much less than a plain building having stone dressings would do. The terra-cotta is being manufactured by Messrs. Doulton & Watts, of Lambeth, and the general contractor is Mr. William Healey, of Salford.

THE BUILDING LAND IN NORTHUMBERLAND AVENUE.

THE St. Martin's Vestry do not appear to be satisfied with the manner in which the Metropolitan Board of Works are letting the surplus building land at Northumberland-avenue, and the subject has been discussed at the lwo last meetings of the Vestry. At the last Mr. Watherston again raised the question, and Mr. Dalton, the representative at the Metropolitan Board, being present, Mr. Watherston said it appeared to him an extraordinary matter that there was so little appearance of building on so eligible and valuable a site, and he wished to know if the reason was that too much money was asked, and too short a lease offered. In reply, Mr. Dalton said the Board thought so much of the site, and the importance of its being a credit to the parish, the metropolis, and themselves, that they would not permit any building that was not to have a stone front. They had had a great number of tenders, but they were, in most cases, below the estimate put upon the land by the architect. The reason why the land was not taken up was the condition of political affairs and the depression of trade. Already one plot was let for an hotel, at a rental of 9,440*l.* a year, and 140,000*l.* were to be laid out upon it; another plot was sold to the Christian Knowledge Society for 45,000*l.*; and a third let to Lord Beaumont at 550*l.* a year. Before the improvement, the rating of the whole property was close upon 8,000*l.* The rating of the hotel alone would be upon double that amount, so that the Vestry would soon have a return for waiting.

THE PROPOSED BUILDINGS ON THE SURREY GARDENS ESTATE, AND THE HEIGHT OF HOUSES.

MESSRS. SUTTON & DUDLEY are now laying out the Surrey Gardens Estate for building purposes, in streets of 40 ft. in width, with the intention of erecting houses on the estate, between 60 ft. and 70 ft. in height, and their application to the Metropolitan Board to be allowed to do so has just caused a discussion of some interest at the Newington Vestry, and also at the Metropolitan Board, in which the height of houses as governed by the width of streets was involved.

At the meeting of the Newington Vestry, Mr. Selway, the representative of the Vestry at the Board, stated that he felt it his duty to oppose the application, because he thought it was proper that the inhabitants of those houses should have as much light and air as possible.

In the discussion which followed, Mr. Hart said he thought it was rather hard on Messrs. Sutton & Dudley. If he was rightly informed Messrs. Sutton & Dudley could make a street 50 ft. wide, and then the Board would have no power over them in any way. He believed that that was what those gentlemen would do if the Metropolitan Board insisted in opposing the erection of those houses.

In answer to a member of the Vestry, Mr. Selway said that if the street were 50 ft. in width the builder could go to any height he liked.

Mr. Barker observed that if Messrs. Sutton & Dudley were driven to avail themselves of this, they would not get any more light or air, for if they had to make the roadway wider they would take away the open space in the rear, and put it in the front, so that he did not think it a question of right or wrong at all,—it was simply a question of robbing Peter to pay Paul. Ultimately a resolution was passed to the effect that the Vestry did not approve of high buildings on the Surrey Gardens Estate, and that this expression of opinion be communicated to the Metropolitan Board in the hope that they would not sanction the erection of the proposed buildings.

When subsequently the subject came before the Metropolitan Board of Works, at their last meeting, the Building Act Committee recommended that the application of Messrs. Sutton & Dudley for permission to erect houses on the Surrey Gardens Estate, exceeding in height the width of the street, be granted.

Mr. Selway moved as an amendment that the application be not granted, and presented the letter from the Newington Vestry in opposition to the erection of the houses to the height proposed. He contended that the height of these houses in a roadway of 40 ft. in width was in opposition to the rule laid down by the Act, and contrary to all sanitary principles.

Mr. Fowler supported the committee's recommendation. The houses it was intended to erect were of a class so much needed, and would be constructed internally with so many modern appliances for comfort and health, that the Board should not object to their erection.

It transpired that there would be forecourts on each side, 5 ft. in width, in addition to the width of the roadway. The Board confirmed the committee's recommendation, so that Messrs. Sutton & Dudley are at liberty to carry the houses to the height named.

ARCHITECTURAL ORNAMENTATION.

IN the discussion which followed Mr. H. H. Stannus's lecture* on this subject at the Architectural Association,

Mr. H. L. Florence, in moving a vote of thanks to the lecturer, said he quite agreed with him as to the importance of reticence. In the application of ornament, the less educated the architect was, the more generally was he inclined to lay on ornament, and to smother his building with it. It was an undoubted fact that there was a great deal too much mere applied ornament on the buildings of the present day, and even those who were most inclined to be reticent in the use of ornament could often, by taking further thought, profitably dispense with some of the ornament shown in their original designs. By such pruning and denudatio n of ornament a building was very often vastly improved, and became stronger and more marked as to its purely architectural forms and proportions. What ornament was used, however, should be well placed and judiciously applied. The way in which it was possible to over-do architectural ornamentation was apparent in Roman buildings, with a few notable exceptions, such as the Farnesina Palace. In many of the works of the modern French school, ornament wasvery judiciously applied. In the judicious application of ornament to architecture there was a vast field for thought and variety of design, and Mr. Stannus had given some valuable hints in the direction of enabling them to think and work out for themselves schemes of architectural ornamentation, not only in words, but by his clever sketches on the blackboard. He (the speaker), therefore, begged to propose a vote of thanks to Mr. Stannus for his interesting lecture.

Mr. Aston Webb, in seconding the motion, said he had been unable from the title of the lecture to gather what turn the subject would take. He had looked in Johnson's Dictionary for a definition of "ornamentation," but it did not give the word. He thought that the word "decoration" would have been preferable, and more worthy of the subject, as "ornamentation" seemed to suggest something of smaller significance than the topic dealt with by the lecturer. As to the smallness in the size of stones in built-up shafts or columns, it was true that at the Madeleine in Paris the stones were so exaggeratedly small as to bring built-up stone columns into ridicule; but in England, where we were able to get stones of fairly large size, he could not see any great harm in building up a column in three or four courses. Why it should be necessary to emphasise the joints in a column any more than in a pier or wall he was unable to see, because no one was in the habit of thinking that all the stone columns he saw were monolithic. As to the amount of ornament allowable in a building, it was impossible to lay down any laws: it was entirely a matter for the architect who designed the building, and was dependent upon a variety of circumstances, such as height from the ground, general composition, and above all, on the taste and feeling of the designer. Mr. Stannus had said that proportion could not be taught; he did not know whether the lecturer quite meant that. Certainly proportion was one of the things which a man could greatly improve himself in. The more they studied both Classic and Gothic examples the more evident would the true principles of proportion becom3, and they would intuitively learn to use those proportions in designing buildings.

Mr. W. Hilton Nash said Mr. Stannus had quoted a remark by John Evelyn about buildings being gay and fine, but a visit to the Paris Exhibition would serve to show that some limit should be imposed upon gaiety in architecture, for there was to be seen a building, supposed to represent the English school of architecture, in which the casements were gilded! He thought that Mr. Stannus had dwelt rather too much upon the faults (which were no doubt many and grave) of the Roman architects, to the exclusion of their redeeming qualities.

The vote of thanks having been carried by acclamation,

Mr. Stannus, in reply, said Mr. Florence had well expressed his leading idea that most buildings would be better for the omission of much of their supposed "ornament." Notwithstanding Mr. Webb's objection, he preferred the word "ornamentation," as best expressing the particular subject of his paper; and he discarded "decoration" as being somewhat "shoppy," and as embracing a wider field than came within the scope of his paper. He adhered to his statement that proportion could not be taught by one man to another, but he agreed with Mr. Aston Webb in saying that it was possible for a man to acquire it for himself. As to Roman architecture, it was not his fault that its defects were more apparent than its excellencies.

* Reported in last week's *Builder*, p. 515.

The Institute Dinner.—We should be glad if we could further the President's wishes in respect of the approaching dinner. Mr. Barry has worked vigorously and well; his energy and tact have been alike conspicuous in the discharge of the presidential duties; and it is due to him that the members should rally round him on this occasion, and make the dinner a success. We have received some letters objecting to the high price fixed on the tickets. We feel sure, however, that the committee have well considered the matter, and decided in the way that seemed best.

PROGRESS OF SANITATION.

SIR,—Your report of the paper on the above subject read at Northampton, on the 15th ult., by Mr. Edwin Chadwick, has induced me to endeavour to suggest a thought to your mind with reference to it.

I have reason to know that sanitary measures are one of your special studies. You were, I believe, one of the first to call attention to the necessity for them. Writing in 1863, in your preface to "Another Blow for Life," you say,—"Ten years ago I pointed attention to the miserable condition of these [London] districts, and said,—'From dirt comes death.'"

In the paper read by Mr. Chadwick he said, "It was now thirty-seven years since he directed an inquiry into the sanitary condition of the town of Northampton." It may be assumed that the sanitary measures put into practice there since his first inquiry have been beneficial. Must it not then be discouraging to all who have the welfare of the public at heart to notice what he further says:—

"The best test of sanitary progress was the infantine death-rate. In the town this would appear to have increased; for, while in 1847 it was 24·8 per cent. of the children under one year, in 1876 it was 29·3 per cent. That, probably, was an exceptional year. For the same years, however, 47 and 45 per cent. respectively of children under five years died. The progress they were making, therefore, must be a most melancholy one, when, of all children born, one half would be in their graves before their sixth year."

The thought I wish to suggest to your mind is this: if the above is the best result of "thirty-seven years'" sanitary progress, it seems likely that there must be some worse than neutralising agency at work. What can it be? It is advisable that this should be sought out; else why should ratepayers be heavily burdened for expensive sanitary works, apparently fruitless of good results?

To quote again from your "Another Blow for Life," which is well worth re-perusal:—

"The newspapers make a tremendous outcry when some poor 'unfortunate' young woman has been driven, by the force of public indignation, to cast her little one into a pond or river; especially if the outcast excite general indignation still further by failing at the same time to commit self-murder; but how serenely the public contemplate that wholesale infanticide which disposes of forty or fifty children out of every 100 before they are five years old."

Again, in another place you say:—

"Slowly, very slowly, do knowledge and experience overcome prejudices and the apparent interests of individuals. It is the duty of all to help in this most desirable object,—not merely their duty, but their interest."

Let me entreat you to act up to the spirit of the last paragraph, and consider whether the real source of the mischief,—the real hindrance to the benefits which should be derived from sanitary progress,—the real agent in keeping up the excessively high infant mortality,—be not vaccination. The return issued lately, at the instance of Mr. Hopwood, M.P. for Stockport, shows that with compulsory vaccination there is a very large increase in the death-rate, especially among very young children.

As my object in this letter is not an attempt to prove the evils of vaccination, but only to point out that I believe the practice of it to be the real drawback to the benefits which may reasonably be expected from the study and practice of good sanitary measures, I refrain from quoting statistics, but will quote the words of an article on the vaccination question, which appeared in *Social Notes* of the 20th ult.:—

"Earnestly, then, would we entreat all lovers of their country and of its true welfare to throw aside the prejudices of early habit, or the apathy which has hitherto kept so large a portion of the more highly educated public in bondage to one of the shallowest and most mischievous delusions ever palmed upon mankind, and to look into the matter for themselves; using their own common-sense and God-given reason in the investigation, instead of relying upon the *ipse dixit* of doctors, the very parties interested, by professional pride and *esprit de corps* (setting all motives of pecuniary profit aside), in maintaining the credit of the idol themselves have set up. Such investigations, conducted in a candid and rational spirit, can lead only to one result."

Words fairly quoted for your own good work, on the title-page of "Another Blow for Life," may also, I believe, be fairly used of the writers of the above paragraph, and other leaders of the anti-vaccination movement:—

"The world may say I've fail'd; I have not fail'd.
If I set truth 'fore men they will not see,
'Tis they who fail, not I. My faith holds firm.
And time will prove me right."—*Charles Swain.*

I earnestly hope you may be of the number who will see, and also help in this most important matter.

Tetbury. F. B.

*** We are not likely to do so. The evidence in favour of vaccination is so conclusive and overwhelming that it is, to us, a matter of astonishment that it should be opposed by even so small a section as are arrayed against it. We print the letter because it is fair that readers should know there are some conscientious, if misinformed, people who see evil where others see good; but we cannot admit any discussion on the subject. There are sufficient known causes still in operation, unfortunately, to account for the frightful death-rate amongst infants still prevailing in parts of the kingdom.

THE MATHEMATICAL EXPRESSION OF THE BEAUTIFUL.

SIR,—In a paper which I read at Antwerp, and which was printed in the *Comptes Rendus* of the first Art Congress held in that city, I expressed an opinion that the mean would, some day, be experimentally demonstrated to be the quantitative expression of the beautiful. With this conviction I made some rude experiments by bringing a number of faces in rapid succession upon the same spot in the retina, and perhaps the experimental demonstration of this important fact will some day be successfully accomplished in this way. But whether it be attained by this kind of means or not, is now of very little consequence, for it would appear to have been effected by a curious composite method of photography, in which some half-a-dozen different faces are combined to produce one image. The result of such a procedure is thus described in the *Echo* of the 21st inst.:—"In the experiments already made the compound photographs are found to represent what is common to each of the portraits, while individual peculiarities are suppressed, the result being a handsome and regular face. By this means it is possible to procure photographs representing the general type of features presented by a race of human beings or the average likeness of a family."

W. CAVE THOMAS.

CONCRETE.

GENERAL CONFERENCE OF ARCHITECTS, 1878.

SIR,—Among the subjects to be considered at these meetings is that of "Concrete and Fire-resisting Construction." Having undertaken to arrange the proceedings for this meeting, I should be much obliged if you would permit me to state in your columns that I shall be happy to receive any communications on these subjects, to be considered at the Conference, especially the results of experience and records of failures or special successes. They should be addressed to me at 7, Whitehall-yard, London, S.W. ARTHUR CATES.

THE GIPSY NUISANCE AT DULWICH.

THE large tribe of Gipsies,—upwards of 200 in number,—which has for some time past been encamped on some land adjoining Lordship-lane, Dulwich, appears to be inflicting most serious injuries upon the inhabitants and property in the district, and for the lawless and shocking state of things which at present prevails the British Land Company appear to be primarily responsible.

The Camberwell Vestry have taken the matter in hand, and last week Mr. Marsden, their clerk, together with a number of gentlemen residing in the district, appeared before Mr. Ellison, the stipendiary magistrate, at Lambeth, to take his advice on the matter, when scenes of the most revolting character were described. Mr. Marsden, in addressing the magistrate, said the case was one of a peculiar character, and one which they had found considerable difficulty in dealing with. A number of gipsies had located themselves in the neighbourhood of Lordship-lane, one of the tribe, residing near Nunhead Cemetery, having purchased a plot of ground from the British Land Company, which for the last two years he had let for this encampment, charging one shilling a day or night for each van. The number encamping amounted to about 200, inclusive of women and children. The Inspector of Nuisances had visited the tents, but from the fact that they kept large and fierce-looking dogs, it was dangerous to approach too near. This state of things in itself was a very serious nuisance to the neighbourhood; but, in addition, there was a nuisance of a still worse and most disgusting character, arising from the fact that they possessed none of those accommodations essential to propriety. The consequence was that there arose a sanitary evil, which it was necessary for the health of the inhabitants to attempt to suppress. Mr. Sharp, who was the owner of a house nearly opposite the land in question, was obliged to keep his blinds closed to shut out the scene which this state of things presented.

Several gentlemen gave evidence of the nuisance.

Mr. James Henderson, a resident in the neighbourhood, testified to the great evil and serious injury to building in the neighbourhood which the tribe has caused. The encampment was on building land, and some of the gentlemen who accompanied him in his visit had recently built very large houses there. The continuance of the nuisance had paralysed fresh building, or doing anything with freshly-built houses.

The magistrate advised proceeding by indictment as the best mode, thinking that the evidence produced was not sufficient in itself to grant a summons under the Nuisances Removal Act. There was very strong evidence for action by indictment, and Mr. Marsden said he would consult as to taking that course.

THE CLOSET AIR ESCAPE.

As Prof. Tyndall has invented and brought into general use for firemen a smoke-escape, by the name of "The Smoke Respirator," it is time something of the kind should come into use for the purpose of avoiding an impure and noxious atmosphere sometimes loaded with contagious effluvia. It consists of an India-rubber tube, called also caoutchouc, from ½ in. to ⅝ in. in diameter (the latter size is rather too large, but should perhaps be preferred), having at one end a convenient mouth-piece flattened from the side like that of Sinclair's, "The Smoke Respirator," and at the other a small hook, so as to hook on to anything outside the closet, such as a nail in the wall.

It is found that it may be 7 ft. in length without any inconvenience in breathing through it, but if any stifling sensation is felt the person has only to inspire through the tube and expire into the closet for a very short space of time, in which there is no difficulty. It should be suspended by hooks or loops to the wall of the closet, the mouth-piece end hanging on the side close to the back of the closet so that the person using it can conveniently breathe through it the whole of the time he occupies the closet. The other end passes through a hole in the wall or over the door if there is space, and is hooked on to the wall outside the closet by a nail.

B. CLARKE, F.L.S.

CAUTION TO ENGINEMEN IN BUILDERS' YARDS.

AT the last sitting of the Wakefield County Court, Messrs. Rhodes & Dalby, contractors, sued George Sugden, one of their late enginemen, for 50*l.*

The case on the part of the masters was that some time since the defendant had charge of one of their powerful engines, and blew the water out of the boiler without having first raked out the fire, and the consequence was that damage was done to the property amounting to 400*l.*, and life was endangered. The act was not considered to be one of malice, or the criminal law would have been put in force, but it was gross carelessness. The plaintiffs now only sued for 50*l.*, an amount paid for repairing the boiler.

The defence was that the engineer did extinguish the fire before he blew out the water; but Sugden, in cross-examination, admitted he negelected to rake out the fire from under the boiler.

The jury gave a verdict for 10*l.*, and the Court ordered the defendant to pay the costs, which, with his own, will "slate" up to 30*l.*

Accident.—Mr. Bedford has held an inquest at King's College Hospital on the body of George Harper, aged thirty-six, labourer, who was engaged on the works in connexion with the New Law Courts. On Tuesday afternoon in last week he was at work on a scaffold, and fell to the ground, a distance of 12 ft. He never spoke, and died the same day in the hospital from the effect of injuries to the head. It was not shown how he came to fall from the scaffold. An open verdict was returned.

VENTILATION.

SIR,—Permit me to correct an error in my letter published in your last week's issue.

It is stated as one of the results of Professor Roscoe's experiments that the quantity of carbonic acid in 100 parts of the air of a "fashionable theatre" when quite full, was found to be at

	Carbonic acid.
34 ft. above the level of the stage, and over the stalls	·2637
Do. 4 ft. above do.	·3212

These figures should have been reversed as follows:—

	Carbonic acid.
34 ft. above the level of the stage, and over the stalls	·3212
Do. 4 ft. only above do.	·2637

It follows that the proportionate quantity of carbonic acid in the lower and upper strata of all the air experimented upon by the two professors was as 1 to 1·1, and not as 1 to 1·042, thus showing still more strongly how erroneous is the assertion made by the writer of the leading and other articles of the *Times*, that the upper part of a room always contains more carbonic acid than the lower part.

Your correspondent "C. H." is not quite correct in saying that "these experiments showed that more carbonic acid *always* existed at the ceiling than at any lower part of the room by a very appreciable amount," for in four out of the twelve experiments referred to the quantity of carbonic acid was found to be greater at the bottom than at the top, and the difference in all cases was very variable, thus showing, as stated in my last letter, that no rule at present exists by which to determine the preponderance of this gas in any particular portion of ordinary air. Neither do I think "C. H." is right in saying that the question "has long been considered beyond dispute, and that it is a mere waste of time to inquire whether ventilation should be upward or downward." The question, it is true, was settled quite to the satisfaction of the members of the Commission referred to by "C. H.," but it is equally clear that the necessity for these letters arises from the fact that the question is by no means beyond dispute with many, and it, therefore, cannot be waste of time to discuss the point. On the contrary, the greatest harm is done by treating this important and difficult subject as an "extremely simple matter" and worthy only the free and easy dictatorial language used by the writer in the *Times*.

H. SAXON SNELL.

AN AWARD.

SIR,—Perhaps some of your numerous readers will be kind enough to assist me by answering the following:—

Some time since I was employed by a client to make some alterations and renovations to a house, upon which a considerable quantity of new, also some good sound old, materials were used, and my workmen employed in preparing and fixing the new and old materials. The conversion of old materials was something considerable. The whole of the work was done with the immediate direction and approval of the client. A few months after, I sent in my bill, charging materials supplied and labour spent in detail, and a small per-centage for my own trouble and profit. This bill was disputed, and after considerable correspondence it was agreed to have the same surveyed. The client named a surveyor, whom I accepted, through his being a F.S.A., and, as I thought, disinterested. The survey was duly gone through, and, after the lapse of five or six weeks, I received notice that the surveyor had made out "an award," and upon paying his fee the same would be disclosed. I have every reason to believe, from what has leaked out, that this same "survey" or "award" is in the form of a few words only, and simply names a sum, which is about half the actual cost of materials and labour put into the work, and, to all appearance, the work measured in detail has never been valued. The surveyor refuses to show any details of his survey. Can any one kindly say what is the common course taken in such a case? Surely I have not to submit to a considerable loss simply by accepting from the surveyor a few words, naming only the sum to be paid? Is there no professional protection for

ONE IN A FIX?

*** "One in a Fix" having agreed to refer the differences is bound, under ordinary circumstances, to accept the award.

COMPANY-MAKING.

ROBINSON *v.* THE MONOLITHIC FIREPROOF, SANITARY, AND CONSTRUCTION WORKS.

THIS was an action brought (in the Chancery Division, before Vice-Chancellor Sir R. Malins) by Mr. Thomas Maltby Robinson, claiming to have a contract rescinded which had been entered into by him for the purchase from the defendants of certain patents for improvements in the construction of buildings.

The plaintiff stated that the patents in question had been sold under a decree made by the Master of the Rolls in March, 1877, to William George Carpenter, for the sum of 50*l*., by a company then in existence, and that they had been immediately afterwards resold to Thomas Bouffler, as agent for the defendant company, for 500*l*.; that the plaintiff had contracted, on behalf of a company about to be formed, to purchase the same patents from the defendants for the sum of 11,000*l*., of which 1,000*l*. was to be paid in cash and 10,000*l*. in shares of the new company. When these facts were discovered, the plaintiff considered that the difference in the price for which the patents had been purchased and that which he was to give for them was so enormous that he refused to carry out the contract.

Mr. Sturges appeared for the plaintiff; the defendants were not represented.

The Vice-Chancellor considered that the facts stated were quite sufficient to warrant a rescinding of the contract, and made the decree claimed.

Barracks, Perth.—It was recently mentioned in these pages that Messrs. Ford & Son, of Montrose, had completed the new wings for the barracks at Perth. We are asked to add that Mr. Jas. Hill supplied all the locks and door furniture throughout the buildings in question.

STAINED GLASS.

Stowmarket.—One of the windows at the east end of the parish church at Stowmarket has just been filled with stained glass. It represents six scenes in our Lord's life, namely, the Garden of Gethsemane, the Scourging, Bearing the Cross, the Last Supper, the Judgment Hall, and "Ecce Homo." The window is in memory of the Rev. Henry Lewis, M.A., for fifteen years vicar of the parish. The work was carried out under the superintendence of Mr. Phipson, architect, Norwich; the designs being executed by Messrs. Clayton & Bell, and Mr. Frederick Brett, contractor, Stowmarket.

Tunbridge Wells.—A stained-glass window has just been introduced into the chancel of Christ Church, Tunbridge Wells. The subjects brought out are intended to illustrate the Divinity of Christ, a Belief in After Life, the Ascension of Christ, and the Preaching of His Gospel. The window has been designed and supplied by Messrs. Morris & Co., of Queen's-square. The expense of the window has been borne by Miss E. L. Carew, of Thornhill, who intends it as a memorial to her deceased sister.

Fulford.—Since the re-opening of Fulford Church, a new stained-glass window has been placed in the north transept by Mrs. Barstow, of Garrow Hill, in memory of her late husband. The window, which has been executed by Messrs. Clayton & Bell, of London, has depicted upon it the two figures of St. Peter and St. Paul.

Workington.—A stained-glass window has been placed in the east end of the south aisle of the parish church, Workington, to the memory of Dr. Anthony Peat. The subject is the "Good Samaritan," who is represented as "pouring in oil and wine," &c., on the wounded man, while in the background are represented two figures, "the Priest and the Levite" passing by "on the other side." The window is by Messrs. Hardman & Co. Birmingham.

Dunfermline.—Another stained-glass window has been inserted in the south-west corner of the old Abbey, thus completing the range of windows on that side of the building. The window has been presented by Mrs. Robert Douglas, of Abbey Parks, and is in memory of her husband, and father and mother. The subject is "Doubting Thomas." The work has been executed by Messrs. James Ballantine & Son, Edinburgh.

Buxted.—The large five-light east window of Buxted Church has just been filled with stained glass as a memorial of Lady Catherine Julia Vernon Harcourt by her husband, Colonel Harcourt. The subjects are the principal events of our Lord's life and death, with the Last Supper below. The subjects are treated in a conventional manner on white backgrounds. The work was executed by Messrs. Heaton, Butler, & Bayne.

Hackney.—Messrs. Pitman & Cuthbertson have completed three stained-glass windows for the chancel of the Catholic Apostolic Church, Mare-street, Hackney, from the designs of Messrs. Perry & Reed.

CHURCH-BUILDING NEWS.

Purley.—Christ Church, Purley, Surrey, was consecrated on the 26th ult. It has been erected from the designs of Mr. James Fowler, architect, Louth, and externally is faced with Kentish rag, with Bath stone dressings. Internally it consists of a nave, chancel, north and south aisles, north transept, organ-chamber, and vestry no the south side of the chancel, and a western porch. In length it is almost 100 ft., with a width of 25 ft. inside. The nave is of three bays, separated from the aisles by pointed arches worked in brick, with occasional bands of stone, above which is arranged, on each side, three clearstory lights. The chancel is a continuation of the nave, without any chancel arch. The chancel is apsidal, and lighted by five lofty lancet windows. The font (the carving of which had been intrusted to Mr. Ruddock), was, with the Communion cloth, presented by Mrs. and Miss Heath, and their friends. The seating throughout is of pitch pine, and arrangements have been made for accommodating 400 worshippers. The style is Early Decorated, and great variety is shown in the treatment of the window tracery and in the carving, which has been executed by Mr. Ruddock, of London; the gasfittings being by Mr. Skidmore, of Coventry. The erection of the building has been completed, under the personal superintendence of the architect, by Messrs. Cornish & Gaymer, of North Walsham, Norfolk, their foreman being Mr. George Wren.

Littlethorpe.—On the 23rd ult. the new church of St. Michael the Archangel at Littlethorpe, near Ripon, was opened. The building consists of nave, chancel, apsidal vestry, organ-chamber, south porch, bell-cot, &c., and is built of common brick, with stone dressings, moulded red and blue Staffordshire bricks being used for window jambs, string-courses, &c. The glazing of the windows is cathedral glass, of different tints, in lead lights The seats are of pitch-pine, and the lectern, prayer-desk, and altar-table are of oak. The floor within the altar-rails and the foot-pace are paved with encaustic tiles. A stained-glass window has been presented for the east end by Canon Worsley. The church will be lighted with pendent ornamental oil-lamps, and is warmed by stoves from Musgrave & Co.'s, of Belfast. The building has been erected from the designs of Mr. R. H. Brodrick, of Ripon, architect. The church will accommodate 120 persons, and will cost over 700*l*.

Tividale.—On the 24th ult. the new church of St. Michael, Tividale, near Dudley, was opened for divine service. The church is built of red brick, with side-aisles, divided from the central aisle by massive stone pillars, with stone caps, but at present these are in a rough state. The chancel is large, and on the left has a commodious vestry, and on the right an organ-chamber. The altar and Communion-table are of variegated marble, and above them are three large windows, which are to be filled with stained glass. At the entrance to the church is a carved marble font, which stands upon a polished granite cross. The church is entirely free, and, instead of pews, the seats are rush-bottomed chairs. The building will accommodate some 800 persons. The cost has been upwards of 8,000*l*., of which Lord Dudley gave 3,000*l*., and of the total sum only about 900*l*. remain to be paid. The tower and spire, which are not yet complete, are to be erected at the entire cost of Lord Dudley. The architects are Messrs. Davies & Middleton, of Dudley; and the builder is Mr. John Everal, Malvern.

GREENSTED CHURCH TIMBER.

SIR,—During the discussion on Mr. Blashill's paper on "The Question of Oak or Chestnut in Old Timber Roofs," at the Royal Institute of British Architects, on Monday evening last, one speaker referred to the use of timber in the nave of the famous church of Greensted, in Essex. The peculiarity of this church is that the walls of the nave are, or were (for I do not know whether any portion of them is yet standing), composed of roughly-hewn trunks of trees, set upright and close together, being let into a sill at the base, and fastened with wooden pins at the top. The question, as I understood it, was whether these trunks were oak or chestnut. The museum at Kew contains a portion of one of these trunks, and though I had always considered it as good oak, I did not venture to assert such an opinion at the meeting before I had had another opportunity of examining the wood. I have since done so, and have no hesitation in saying that it is undoubtedly oak. This, I think, is another proof of the soundness of Mr. Blashill's views.

JOHN R. JACKSON, A.L.S.,
Kew. Curator of Museums.

COMPETITIONS.

New Hull Botanic Gardens.—The design by Messrs. W. K. Reeves & F. W. Hagen, of Hull, for manager's residence, has been selected by the committee from the fourteen lots of designs submitted by nine local architects.

Hemel Hempstead Infants' School.—The School Board have had under consideration the designs submitted in a limited competition for rebuilding the infants' school in Queen-street, and have decided in favour of that submitted by Mr. George Low, of London, architect.

Board of Works, Spring-gardens.—A committee has reported it is desirable that an additional story should be erected on the Offices of the Board.

Miscellanea.

Builders' Benevolent Institution.—The forty-ninth election of pensioners in connexion with this Institution was held on Thursday last at Willis's Rooms, St. James's, Mr. Simpson in the chair, in the unavoidable absence of the president, Mr. William Higgs. There were three vacancies to be filled up, and as there were only three candidates (G. T. Spurgin, Thomas Nash, and W. Biscombe) there was no poll, and the candidates were, on the motion of Mr. George Plucknett, seconded by Mr. Thomas Stirling, unanimously elected. A vote of thanks to the chairman (moved by Mr. Plucknett, and seconded by Mr. Bussell) closed the proceedings. We understand that it was at first proposed to elect only two of the candidates, but the committee determined to elect the three candidates, trusting that their action would be justified by an increase in the subscriptions, especially in view of the fact that the pensions have been considerably increased in amount. The annual meeting of the Institution will take place on the 25th of July.

Gray's-inn-road.—In the House of Commons Mr. Hubbard asked the Secretary of State for the Home Department whether his attention had been directed to the dangerous insalubrity of some dwellings in Gray's-inn-road; and whether he could explain why apparently no steps were being taken for the reconstruction of the adjacent district, although a scheme for that purpose was the very earliest among those which were suggested in pursuance of the provisions of the Artisans' Dwellings Act. Mr. Cross said that it was quite true that the part of London referred to had been reported upon by the medical authorities; and he could not conceive any worse place in the whole of London. The scheme that was originally presented by the officers of the Metropolitan Board of Works was a large and comprehensive one; but, unfortunately, the Metropolitan Board of Works cut down that scheme, and presented it in such a mutilated form that it was perfectly unworthy of being passed into a law. He was told that under another Act the Metropolitan Board would pull down one side of Gray's-inn-road, and this would do away with a part of the houses which it was desired to clear away before undertaking a scheme to reconstruct new houses. He hoped this scheme would be speedily carried out; but he must refer his hon. friend to the chairman of the Metropolitan Board of Works for further information on the subject.

St. James's, Piccadilly. — Prebendary Kempe, preaching at St. James's, Piccadilly, stated that in a few days he should have held the living for a quarter of a century, the longest period, with one exception, of its having been held by any rector since its separation from St. Martin's by Archbishop Tenison, and that he desired to signalise this semi-jubilee by effecting certain alterations and improvements in St. James's Church. The works contemplated were—1. Arranging and fitting up the eastern end in such a manner as to give it more of the aspect and character of a chancel. 2. Enriching and brightening the mouldings of the ceiling and of the arcades that vault the galleries. Something had been done towards it twelve years ago. 3. Re-pewing the church. 4. Providing stained-glass for such windows as are not already fitted with it. 5. Moving the font, an interesting and almost unique work of Grinling Gibbons, into the vestibule under the tower, and in fitting up the vestibule as a baptistery, with a marble pavement and a painted window by one of the best artists.

New Roman Catholic Church at Rivelin Glen—The new church at the Catholic Cemetery, in Rivelin Valley, was opened a few days ago. The church is dedicated to St. Michael. It is in the Early English style of architecture, and built of hammer-dressed Greenmoor wall-stone, with Worrall stone dressings. It is 22 ft. wide and 72 ft. long internally, and has an open roof, covered with Staffordshire tiles. At the western end a bell-turret, in which hangs a bell by Mears, of London, rises to a height of 60 ft., and in the gable of the south porch is a niche, with a fine figure of St. Michael slaying the dragon. The chancel floor is laid with encaustic tiles, and there is an altar of polished marble and veined alabaster, with a sculptured figure of "The Dead Christ" underneath in white alabaster, by Boulton, of Cheltenham. Messrs. Hadfield & Son were the architects, and Mr. M. J. Dowling was the contractor.

Supposed Explosiveness of Flour-dust. The explosiveness of flour-dust when diffused through the air, says the *American Architect*, of which we made mention at the time of the explosion of the Greenfield Candy Factory, in New York, has apparently received a startling illustration in the destruction of the flouring mills at Minneapolis. The manner in which the accident occurred can never be made clear, for every man perished who was in the great Washburn Mill where the first explosion occurred; but no other cause than the flour-dust has been seriously argued, so far as is known. The material, which could by its detonation, throw down in an instant all four solid stone walls of the great mill, more than 100 ft. square, and lift the roof bodily some hundreds of feet into the air, must have been pretty thoroughly diffused throughout the building.

The Sessions House, Old Bailey.—At a meeting of the Court of Common Council on the 16th inst., the City Lands Committee, reporting on a reference to consider the state and condition of the Sessions House, Old Bailey, stated that in their opinion the only mode of providing suitable accommodation for the transaction and conduct of the business of the Central Criminal Court would be to take down all the existing buildings at the Sessions House, and erect new courts and offices upon the site thereof, and the vacant ground and premises adjoining. The consideration of the subject was postponed.

TENDERS

For alterations to the Assembly House, Kentish-town, for Mr. W. Harwood. Mr. Edward Brown, architect:—

Smeed	£299 10 0
Dickens	290 0 0
Cocks	236 9 0
Marr (accepted)	229 0 0

For alterations to the Manor House, Finsbury Park, for Mr. S. Medcalf. Mr. Edward Brown, architect:—

Stamp & Bowtle	£818 0 0
Salt	796 0 0

For alterations to No. 36, Commercial-street, Spitalfields, for Messrs. Murrey, Patterson, & Roberts. Mr. Edward Brown, architect:—

Salt	£135 0 0
Marr (accepted)	134 5 0

For six model cottages at Roehampton, for Mr. T. D. Galpin. Mr. Samuel Knight, architect. Quantities not supplied:—

		Extra for high-pitched roof, tiled.
Nightingale	£2,325	£35
Shepherd	2,258	95
Pain	2,244	—
Harvey	2,220	50
Sutton (accepted)	2,030	20

Accepted for the erection of a Foresters' Hall and two houses and shops, in West-street, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Excavator's, Bricklayer's, Carpenter's, Ironmonger's, &c., Work.

Simonds	£3,184 0 0

Plumbing, Painting, &c.

Gocher	354 0 0

Smith and Founder's Work.

Wright	221 2 0

For additions to the Foreign Missionary College of the Sacred Heart, Mill-hill, for Canon Benoit:—

Butler	£416 0 0

For the restoration of Donington Church, Salop. Mr. John Norton, architect:—

Espley & Son	£2,400 0 0
Fisher & Co.	1,992 0 0
Stephens & Bastow	1,899 0 0
G. & F. Heigham	1,868 0 0
Nevett Bros.	1,657 0 0
Cornish & Gaymer	1,625 0 0
Patterson & Sons	1,605 0 0
Lovatt	1,593 0 0
Bullock & Son (too late)	1,467 0 0
Cadman (too late)	1,450 0 0
Bateman & Doody	1,298 10 0
Martin (accepted)	1,270 0 0

For the erection of new Hide, Skin, and Fat Market, in the Eastcroft, Nottingham. Mr. S. Dutton Walker, architect:—

Vickers	£5,615 0 0
Attenborrow	5,549 0 0
Bell & Son	5,470 0 0
Lowe	5,460 0 0
Stevenson	5,366 0 0
Roberts & Perkins	5,342 0 0
Messom	5,300 0 0
Fish & Son	5,220 0 0
Willimot & Wray	5,209 0 0
Hind	5,111 0 0
Wooll	5,100 0 0
Wheatley & Maule	5,053 0 0
Jelley	4,995 0 0
Middleton	4,980 0 0
Clark	4,971 0 0
Hodson & Facon	4,905 0 0
Bailey	4,879 10 0
Fisher & Hutchinson	4,877 0 0
Lees, Brothers (accepted)	4,749 0 0

For the erection of the New Bible Christian Chapel and two houses, Percy-road, Kilburn Park. Mr. W. Ranger, architect:—

	Chapel.	Houses.
Gwyer	£3,109	£1,224
Jones & Co.	2,950	1,362
Taylor	2,991	1,188
Bailey	2,770	1,188
Hook & Oldrey	2,719	1,130
Ennor, Julian, & Co.	2,530	1,120
Richardson, Brothers	2,495	1,053
Allen (accepted)	2,325	996
Collins & Co.	—	990

For new house, at Monk's Wood Farm, near Huntingdon, for the Right Hon. Lord Chesham. Messrs. Sedgwick & Son, architects:—

Frances	£1,315 0 0
Whiteman (accepted)	1,285 10 0

For block of three, and two single cottages, on the Westhorpe Estate, Little Marlow, Bucks, for Mr. J. P. Ellames. Messrs. Sedgwick & Son, architects:—

J. S. Carter	£1,270 0 0
R. G. Carter	1,123 11 2

For three pairs of semi-detached cottages, on the Thurlow Estate, Great Thurlow, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick & Son, architects:—

Mason & Son (accepted)	£1,200 0 0

For alterations and repairs to house and buildings at Bourne Farm, on the Breakspeare Estate, near Uxbridge, for Mrs. W. W. Drake. Messrs. Sedgwick & Son, architects:—

Brown (accepted)	£735 0 0

For converting into three cottages the old malting, at Troy Place, near Rickmansworth, for the provost and scholars of King's College, Cambridge. Messrs. Sedgwick & Son, architects:—

Brown (accepted)	£400 0 0

For new warehouse, in the Old Bailey. Mr. Lewis Solomon, architect. Quantities supplied by Messrs. Williams & Gritten:—

Lidstone	£1,447 0 0
Downs	1,287 0 0
Larter	1,284 0 0
Patman & Fotheringham	1,190 0 0
Elkington	1,100 0 0

For rebuilding and enlarging Radcliffe-on-Trent Church, Notts. Messrs. Goddard & Paget, architects. Quantities not supplied:—

Fisher & Co.	£6,078 0 0
Bradley & Co.	6,010 0 0
Young	5,186 0 0
Allen	4,900 0 0
Barlow, Brothers (accepted)	4,931 0 0

For houses and shops, at Stoke Newington-road. Mr William Reddall, architect:—

Pringle	£14,235 10 0
Forrest	13,528 0 0
Hayworth	13,450 0 0
Palmer	12,084 0 0
Goodall	11,955 0 0
Marr	11,915 0 0
Garrud	11,776 0 0

For pulling down and rebuilding the Swan Hotel, Fenny Stratford, Bucks, for Messrs. Holdorn. Mr. Frederick Gotto, architect:—

Fincher & Smith	£1,699 0 0
Esau	1,308 0 0
Stanniford	1,280 0 0
Adams & Gates	1,160 0 0
Gibbs	1,154 0 0
Gates (accepted)	1,151 0 0

For erecting a new chapel of ease, at Iping Marsh, Sussex, for the Rev. F. R. Stratton. Mr. E. P. Loftus Brock, architect:—

Trigg	£738 16 6
Walder, jun. (accepted)	523 0 0

For Primitive Methodist chapel and school, Hackney-road. Mr. A. J. Rouse, architect:—

	Chapel and School.	Tracery Windows.
Heather & Davies	£4,702	£100
T. J. Williams,	4,250	52
Staines & Son	3,988	98
Steed, Brothers	3,900	117
Shurmur	3,809	111
A. G. Williams,	3,789	132
Stimpson & Co.	3,675	64
Sampson & Parrish	3,697	175
Niblett	3,638	143
Garrud	3,583	175
Chapman	3,571	103
Linfield	3,504	83
Webber	3,475	—

For alterations, &c., White Horse and Cross Keys Tavern, Goswell-road. Mr. C. H. Flack, architect:—

	Old Buildings.	Bar-fittings.
Langmead & Way	£1,028	£450
Crabb	950	340
Somers	850	437
Chapman	812	340
Ward	817	366
Beale	630	280

For new staircase to Middlesex Lunatic Asylum, Hanwell. Mr. Martin, engineer:—

Carless	£2,834 0 0
Nye	2,295 0 0
Lascelles	2,282 0 0
Higgs & Hill	2,280 0 0
Langmead & Way	2,195 0 0

For residence, with stabling, in Netherhall-terrace, Hampstead. Messrs. Spalding & Evans, architects:—

		Extra for Pitch Pine.
Roberts	£4,585	£58
Lascelles	4,440	86
Cook	4,330	—
Downs & Co.	4,310	105
Shepherd	4,259	91
Nightingale	4,181	55

For erecting new warehouse premises, at South Bermondsey, for Mr. J. Phillips. Mr. J. Johnson, architect:—

Castle	£1,055	0	0
Pike	913	0	0
Maxwell, Brothers	879	0	0
Hoare & Son (accepted)	837	0	0

For additions to Fern Bank, Roehampton Park. Messrs. Spalding & Evans, architects:—

Eborall	560	0	0
Pain	548	0	0
Stamp & Bowtle	447	0	0

For new house, at Heathfield, Hampstead. Messrs. Spalding & Evans, architects:—

Roberts	£2,749	0	0
Temple & Forster	2,730	0	0
Lascelles	2,683	0	0
King & Brown	2,582	0	0
Cook	2,550	0	0
Downs & Co.	2,520	0	0
Shepherd	2,489	0	0
Nightingale	2,447	0	0

For alterations and additions to No. 35, Granville Park, Blackheath. Messrs. Spalding & Evans, architects:—
Philps & Bisiker (accepted)

For the erection of new offices and chambers, 22, Pall-mall, and 33, St. James's-square, for the Imperial Insurance Company. Messrs. Osborn & Russell, architects:—
Contract No. 1.

Merritt & Ashby	£4,650	0	0
Colls & Son	4,438	0	0
Brass	4,396	0	0
Grover	4,283	0	0
Chessum	4,163	0	0
Sabey & Son (accepted)	4,040	0	0

For Fire Brigade Station, Bridewell-street, Bristol. Mr. J. Thomas, architect:—

Krauss	£6,176	0	0
Easterbrook & Sons	5,960	0	0
Cowlin & Sons	5,795	0	0
Church	5,694	0	0
Brock & Bruce	5,600	0	0
Howell	5,600	0	0
Hatherly	5,453	0	0
Humphry	5,440	0	0
Davis	5,389	0	0
Williams & Sons	5,300	0	0
Stephens & Bastow	5,199	0	0

For rebuilding house and shop, 23, High-street, Poplar, for Mr. Henry Wickes. Messrs. A. & C. Harston, architects:—

Jacobs	£1,760	0	0
Palmer	1,650	0	0
Riddle	1,600	0	0
Coleman	1,573	0	0
Harle	1,493	0	0
Johnson	1,397	0	0

For the London and South-Western Bank, Small-street, Bristol. Mr. J. Weir, architect. Mr. C. Mayland, surveyor. Quantities supplied:—

	Bath.	Doulting.	Portland.
Easterbrook	£22,300	£23,300	£25,600
Wilkins	22,000	22,800	25,400
Church	20,700	21,972	24,400
Veales	20,000	21,000	21,850
Kingston	19,622	—	20,022
Hatherly	19,143	19,975	22,030
Davis	18,900	19,950	19,640
Baker	18,440	19,940	19,640
Crocker	18,119	18,450	18,919
Brock & Bruce	17,850	19,310	19,810
Stephens & Bastow	17,295	18,147	19,895
Howell	17,150	17,400	19,500

For schools at Mildmay Park, Mr. Chessum's tender was 2,43*l.*, not 4,43*l.*, as printed in the list of tenders last week.

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Ventilation (some communications on this subject will have consideration next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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